



Department of Mines, India

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# REPORT

OF THE

# CHIEF INSPECTOR OF MINES IN INDIA

*UNDER THE INDIAN MINES ACT (VIII OF 1901)*

FOR THE YEAR ENDING

31st December 1923

BY

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*Chief Inspector of Mines in India*



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# CONTENTS.

INTRODUCTION—	PAGE.
Relates to administration of the Act . . . . .	1
Other mining statistical publications . . . . .	1
SECTION I.—PERSONS EMPLOYED—	
Average figures of labour . . . . .	1
Increase compared with previous year . . . . .	1
Supply of labour in Bengal and Bihar and Orissa coalfields . . . . .	1
Labour troubles in the Giridih coalfield . . . . .	1
Supply of labour in Assam . . . . .	2
"    "    "    "    the Central Provinces . . . . .	2
Average output of coal per person employed in India . . . . .	2
"    "    "    "    "    "    "    "    Great Britain . . . . .	2
"    "    "    "    "    "    "    "    the United States of America . . . . .	2
Comparison between wages paid to coal and other miners in the different provinces of India . . . . .	2
Liberal wages paid to the Indian coal miner . . . . .	2
Statement of hours worked and wages paid at a large representative mine in each important mining field in British India . . . . .	3
Physical conditions of mining in the Indian coalfields . . . . .	3
Conditions of employment underground imposed by Indian Mines Act, 1923 . . . . .	3
Advantages of system of working in shifts . . . . .	3
Employment of women in underground mines . . . . .	4
Conditions under which Indian labourers live at mines . . . . .	4
Jharia Mines Board of Health's campaign for improvement of housing . . . . .	4
SECTION II.—OUTPUT OF MINERALS—	
Coal output in various provinces . . . . .	4
"    "    increase on previous year . . . . .	5
"    "    opening and closing stocks . . . . .	5
"    "    chart of monthly raisings and despatches of coal . . . . .	5
"    "    despatches . . . . .	5
"    "    amount delivered to coking . . . . .	5
"    "    "    of hard and of soft coke made . . . . .	5
"    "    increase in Bihar and Orissa . . . . .	5
"    "    "    "    Bengal . . . . .	5
"    "    decrease in Central Provinces and other Provinces . . . . .	5
"    "    percentage of increase on previous year's output in the Jharia coalfield . . . . .	5
"    "    percentage of increase on previous year's output in the Raniganj coalfield . . . . .	5
"    "    attempt to recover lost export trade . . . . .	6
"    "    depression in Central Provinces coal trade . . . . .	6
"    "    number of mines at which electric power used . . . . .	6
"    "    increase in the number of coal cutting machines . . . . .	6
"    "    number of coal cutting machines in use at different coalfields . . . . .	6
"    "    amount of square feet of coal undercut by coal cutting machines . . . . .	6
"    "    increase in use of explosives at mines . . . . .	6
"    "    improvements made in collieries in Jharia coalfield . . . . .	6
Mica output, increase in . . . . .	6
"    "    compared with previous year . . . . .	6
"    "    demand for better qualities of mica . . . . .	6
Manganese ore output, increase in . . . . .	7
"    "    "    compared with previous year . . . . .	7
"    "    "    good demand throughout the year. . . . .	7
"    "    "    rise in price . . . . .	7
Rock salt output, decrease in . . . . .	7
"    "    "    "    "    due to weakness of demand . . . . .	7
Lead-Silver ores output, increase in . . . . .	7
"    "    "    "    compared with previous year . . . . .	7
"    "    "    "    average prices of refined lead and refined silver . . . . .	7
Wolfram and tin ores output, decline in . . . . .	7
"    "    "    "    "    compared with previous year . . . . .	7

SECTION II.—OUTPUT OF MINERALS—*contd.*

Gems output, decrease in . . . . .	7
"    "    compared with previous year . . . . .	7
"    "    Rubies . . . . .	7
"    "    Sapphires . . . . .	7
"    "    Spinel . . . . .	7
"    "    Hyalite . . . . .	7
"    Rubies, continued demand in London . . . . .	7
"    decrease in " native mining " . . . . .	7
Gold output, decrease in . . . . .	8
"    price per ounce of fine gold . . . . .	8
Copper ore output, decrease in . . . . .	8
"    "    "    compared with previous year . . . . .	8
"    "    increase in price of . . . . .	8
Iron ore output, increase in . . . . .	8
Chromite ore output, increase in . . . . .	8
Limestone output, increase in . . . . .	8
Steatite " " " . . . . .	8
Ochre " " " . . . . .	8
Barytes " " " . . . . .	8
Slate " decrease in . . . . .	8
Magnesite " increase in . . . . .	8
Apatite . " " " . . . . .	8
Clay " decrease in . . . . .	8
Fuller's earth output, decrease in . . . . .	8
Bauxite output, increase in . . . . .	8

## SECTION III.—ACCIDENTS—

Accident, increase in . . . . .	8
"    compared with previous year . . . . .	8
"    "    "    average of preceding five years . . . . .	8
"    Chart showing the gradual increase in the death rate during the period 1914-1923 . . . . .	8
"    loss of lives involved, increase on previous year . . . . .	8
"    "    "    classified . . . . .	9
"    increase of, by falls of roof and sides . . . . .	9
"    in shafts . . . . .	9
"    increase of, by haulage . . . . .	9
"    by explosions of fire-damp . . . . .	9
"    "    explosives . . . . .	9
"    "    suffocation of gases . . . . .	10
"    by electricity . . . . .	10
Death-rates per thousand persons employed in India . . . . .	10
"    "    "    "    "    "    "    at coalmines only . . . . .	10
"    "    "    "    "    "    "    Great Britain for the decade 1911-1922 . . . . .	10
"    "    million tons of coal raised in India . . . . .	10
"    "    "    "    "    "    "    Great Britain for the decade 1911-1922 . . . . .	10
"    at coal mines in Great Britain in 1922 . . . . .	10
"    "    "    "    "    the United States of America in 1922 . . . . .	10
"    "    "    "    "    India in 1922 . . . . .	10
Number of deaths at each class of mine worked . . . . .	10
Deaths, classified . . . . .	10
"    non-statistical . . . . .	10
Accidents, commented on . . . . .	10—21

## Explosions of fire-damp or coal dust—

Accident at the Bengal Coal Company, Limited's Parbelia coal mine . . . . .	10—15
---	-------

## Falls of roof—

Accident at Rai Sahib H. Verma and M. Kanhaiyalal, Limited's Rawanwara coal mine . . . . .	15, 16
"    "    the Equitable Coal Company, Limited's Dishergarh East coal mine . . . . .	16
"    "    Standard Coal Company, Limited's Benahir coal mine . . . . .	16, 17
"    "    Standard Coal Company, Limited's Jharia Khas coal mine . . . . .	16, 17

SECTION III.—ACCIDENTS—*contd.*

PAGE.

## Falls of side—

Accident at Messrs. Hajeebhoy Laljee and Company's Mahakali coal mine . . . . .	17
„ „ the Bokaro-Rangur Limited's Dhori coal mine . . . . .	17
„ „ Mr. A. H. Gaston's Cherangcode mica mine . . . . .	18

## Suffocation by gases—

Accident at the Pench Valley Coal Company, Limited's Chandametta coal mine . . . . .	18
„ „ „ Bengal Coal Company, Limited's Sodepur coal mine . . . . .	18-20

## In shafts—

Accident at the Burma Corporation, Limited's Bawdwin lead-silver mine . . . . .	20
„ „ „ Central Kurkend Coal Company, Limited's Central Kurkend coal mine . . . . .	20

## Sundries underground—

Accident at the Khas Jherria Colliery Company, Limited's Khas Jherria coal mine . . . . .	20, 21
---	--------

## Miscellaneous on surface—

Accident at Messrs. Villiers, Limited's Bagdiggi coal mine . . . . .	21
--	----

## SECTION IV.—PROSECUTIONS AND ADDITIONS TO THE ACT—

## Prosecutions under the Indian Mines Act and Indian Penal Code—

J. P. Lalla's Tundu Khas coal mine . . . . .	21
Pramode Kumar Sen Gupta . . . . .	21
Dharani Dhar Chowdhuri . . . . .	21
Hajeebhoy Laljee's Mahakali coal mine . . . . .	22
W. C. Bhattacharji's Egarcour coal mine . . . . .	22
A. H. Gaston's Cherangcode mica mine . . . . .	22
Sheopersan Tewari's Pathariachuck coal mine . . . . .	22
S. N. Bose's Banderchua coal mine . . . . .	22
Tata Iron and Steel Company, Limited's Choitodih coal mine . . . . .	22
B. P. Singh's Kalipahari coal mine . . . . .	22
G. L. Mukherji's Parhargora coal mine . . . . .	22
Rai Sahib H. Verma and M. Kanhaiyalal, Limited's Rawanwara coal mine . . . . .	22
The owners of 17 mines for non-submission of Annual Returns for 1922 . . . . .	22

## Prosecutions of employes—

Central Provinces Prospecting Syndicate, Limited's Balaghat manganese mine . . . . .	22
Samla Govindpur Collieries, Limited's Baidyanathpur coal mine . . . . .	22
Bengal Iron Company, Limited's Ramnagore coal mine . . . . .	22
Burrakur Coal Company, Limited's Joba coal mine . . . . .	22
„ „ „ „ Charanpur coal mine . . . . .	23
Central Kurkend Coal Company, Limited's Central Kurkend coal mine . . . . .	23
Bansdeopur Coal Company, Limited's Bansdeopur coal mine . . . . .	23
Jharia Coal Association's Harinachak coal mine . . . . .	23
Great Indian Peninsula Railway Company's Mohpani coal mine . . . . .	23

## Indian Mines Act, 1901—

Section 20—Publication of rules for the examination and certification of underground sirdars . . . . .	23
Section 21—Establishment of special Rules at coal and non-coal mines . . . . .	23

## SECTION V.—GENERAL REMARKS—

## Health and Sanitation—

## Asansol Mines Board of Health—

Number of meetings . . . . .	23
Epidemic diseases . . . . .	23
Anti-malarial operations . . . . .	23
Death rate per thousand . . . . .	23
Birth rate per thousand . . . . .	23

## Jharia Mines Board of Health—

Number of meetings . . . . .	23
Epidemic diseases . . . . .	23

	PAGE.
SECTION V.—GENERAL REMARKS— <i>contd.</i>	
Jharia Mines Board of Health— <i>contd.</i>	
Death rate per thousand . . . . .	23
Birth rate per thousand . . . . .	23
Measures for improvement of housing of colliery labour . . . . .	23
Rainfall statistics—	
Coalfields of Jharia, Raniganj and Giridih . . . . .	24
Mining Education—	
Report of Principal, Bengal Engineering College . . . . .	24
Annual Mining Camp, „ „ „ . . . . .	24
Mining Education Advisory Board, Meetings held by . . . . .	24
Introduction of new course of instruction in the Raniganj coalfield . . . . .	24
Delivery of lectures in Hindi in the Jharia coalfield . . . . .	24
„ „ „ „ Bengali in the Raniganj coalfield . . . . .	24
Introduction of a course of instruction in mining in the Pench Valley coalfield . . . . .	24
Board of Examiners for Coal Mine Managers' Certificates—	
Number of meetings held . . . . .	25
„ „ Indian certificates granted in lieu of British certificates . . . . .	25
Results of examinations for colliery managers' certificates of competency . . . . .	25
Local Examiners and Secretaries . . . . .	25
Publication of question papers . . . . .	25
Mining Boards—	
Number of meetings . . . . .	25
Business transacted . . . . .	25
Mining and Geological Institute of India—	
Membership . . . . .	25
Number of meetings held . . . . .	25
Business transacted . . . . .	25
Award of Government prize . . . . .	25
„ „ Institute's medals . . . . .	25
Association of Colliery Managers in India—	
Questions dealt with by Council . . . . .	26
Ambulance work in the coalfields—	
St. John Ambulance Association, Formation of local centres in the Jharia and Raniganj coalfields . . . . .	26
St. John Ambulance Association, Grant of First Aid Certificates . . . . .	26
Land Acquisition (Mines) Act, 1885—	
Number of cases disposed of . . . . .	26
Applications for employment—	
Register of applicants for employment holding first or second class colliery managers' certificates . . . . .	26
Coal Dust Committee—	
Appointment of Committee . . . . .	26
Personnel of „ . . . . .	26
Terms of reference . . . . .	27
Sum allotted for expenditure in 1923-24 . . . . .	27
Nature of work performed . . . . .	27
Official duties—	
Personnel . . . . .	27

	PAGE.
APPENDIX I.—Statistics of Mines and Minerals—	
Table No. 1.—Number of mines and workers and output of Minerals . . . . .	29—41
„ „ 2.—Analyses of figures relating to output of coal and coke . . . . .	42—43
„ „ 3.—Number of mines opened and closed . . . . .	44—47
„ „ 4.—Fluctuations of outputs . . . . .	48
„ „ 5.—Coal raised and death rates . . . . .	48
„ „ 6.—Aggregate horse power and purpose for use of electric motors installed at coal mines . . . . .	49
„ „ 7.—Aggregate horse power of electric motors installed at all mines . . . . .	49
„ „ 8.—Number and type of coal cutting machines at work in coal mines . . . . .	50
„ „ 9.—Number of mechanical ventilators in use at coal mines . . . . .	50
„ „ 10.—Number of safety lamps in use at coal mines . . . . .	50
APPENDIX II.—Accidents in Mines—	
Table No. 1.—List of fatal accidents . . . . .	51—90
„ „ 2.—Fatal and serious accidents . . . . .	91—96
„ „ 3.—Fatal accidents and deaths classified according to age and sex . . . . .	97—98
„ „ 4.—Fatal accidents classified according to cause . . . . .	99
APPENDIX III.—Prosecutions under the Act . . . . .	100—101
APPENDIX IV.—Miscellaneous—	
Statement No. 1.—List of inspection circles . . . . .	102
„ „ 2.—List of certificate holders . . . . .	102—104
„ „ 3.—List of Mining Universities and Colleges approved by Government for purposes of Rules 32 and 33 of the Act . . . . .	105
„ „ 4.—Bengal Engineering College Mining classes . . . . .	106
„ „ 5.—Mining Instruction in the coalfield of Bengal and Bihar and Orissa . . . . .	107—109
„ „ 6.—Mining Instruction in Bihar and Orissa . . . . .	110—112
„ „ 7.—Question papers set at examinations for colliery managers' certificates of competency . . . . .	112—117
„ „ 8.—Government of India, Department of Industries and Labour, Notification regarding the examination and certification of underground sirdars . . . . .	117—119
„ „ 9.—Particulars to be furnished under Section 4, Land Acquisition (Mines) Act, 1885 . . . . .	120





FROM

R. R. SIMPSON, Esq., M.Sc.,  
*Chief Inspector of Mines in India,*

TO

THE SECRETARY TO THE GOVERNMENT OF INDIA,  
DEPARTMENT OF INDUSTRIES AND LABOUR, SIMLA;

*Dated Dhanbad, the 14th June 1924.*

SIR,

I have the honour to submit the report upon the inspection of mines in British India for the year ending 31st December 1923.

## INTRODUCTION.

It may be explained that this report relates entirely to the administration of the Indian Mines Act, 1901. The Act applies to British India only and not to the Indian States. Mines which are less than 20 feet deep are excluded from its scope. For the complete figures of production of all minerals raised from excavations of all depths in British India and the Indian States reference may be made to the statements of the "Mineral Production of India" published in the Records of the Geological Survey of India, and to the "Quinquennial Review of the Mineral Production of India" published every five years by the same Department. Mysore, where the Kolar goldfield is situated, and Hyderabad (Nizam's Dominions), have their own Departments of Mines. Detailed information of the mineral industries of those States is given in the annual reports of their respective Chief Inspectors of Mines.

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### Section I.—Persons Employed.

During the year 1923 the daily average number of persons working in and about the mines regulated by the Indian Mines Act was 234,864, as compared with 228,511 in the previous year. This is an increase of 6,353 persons or 2·78 per cent. Of these persons 145,831 worked underground and 89,033 on the surface.

One hundred and forty-seven thousand two hundred and fifty were adult males, 80,254 were adult females and 7,360 were children under 12 years of age employed in 1922.

Those employed in coal mines numbered 182,601 which is 1,754 less than those employed in 1922.

In the Jharia and Raniganj coalfields labour generally with the exception of that in a few favourably situated centres continued to be far below requirements, but towards the end of the year there was a great improvement, and in the busy season of 1923-24 the supply of coal mining labour was better than it has been for many years. Wages remained stationary. There was no serious epidemic disease, and the general health of the labour force in the two coalfields was good. In the Asansol and Jharia mining settlements the death rates were under 18 per thousand.

In the Giridih coalfield the labour attendance was not satisfactory. Owing to an early rainfall the cultivation season was prolonged, and the output was adversely affected. Subsequently the labour attendance improved and was excellent in the latter part of the year. In January the coal-cutters went on strike,

but they returned to work unconditionally within a week. In some instances the rates of wages for coal getting were reduced, and this had the immediate effect of increasing output.

At the Margherita collieries in Upper Assam the total number of adults working at the mines was 5,147, and during the year there were 2,885 recruitments and 1,540 repatriations. The recruitments were unusually high as an effort was made to replace the Nepalese who nearly all left the mines owing to a misunderstanding in respect of the terms of employment. Early in the year wage rates were reduced by 11 per cent. There were 300 cases of influenza with 39 deaths.

In the Central Provinces the labour conditions on the mines have been generally satisfactory, although as is always the case in time of good demand the mineowners could have employed larger numbers than were available. At the Kachidhana manganese mine there were 108 cases of plague with 38 deaths.

Figures showing the average output per person employed are given below :—

	TONS PER PERSON EMPLOYED.			
	Below ground.		Above and below ground.	
	1923.	1918—22.	1923.	1918—22
British India . . . . .	172	174	103	104
Bengal and Bihar . . . . .	179	181	107	107
Assam . . . . .	133	149	84	96
Baluchistan . . . . .	54	62	30	35
Central Provinces . . . . .	94	98	56	62
Punjab . . . . .	73	66	41	39

It should be explained that in calculating the averages women and children are classed with adult male labourers. In Great Britain in 1922 the output of coal per person employed below ground was 271 tons, and per person employed above and below ground 217 tons. A fairer comparison, however, would be with the United States of America where the mining conditions approximate more closely to conditions in India than to conditions in Great Britain. In the United States of America during 1922 the output of coal per person employed below ground was 611 tons, and per person employed above and below ground 504 tons. The comparatively low output of the Indian miner is largely due to the small extent to which labour saving appliances are used in comparison with other countries.

In the table on page 5 figures are given of hours worked and wages paid at a large representative mine in each important mining field in India. Perhaps the most remarkable feature about this table is the lowness of the weekly earnings of coal miners in Bihar and Orissa, Bengal and the Central Provinces, as compared with the wages of coal miners employed in Assam, the Punjab and Baluchistan, and with the wages paid to gold miners in Madras and lead and tin miners in Burma. At certain coal mines in Bihar and Orissa, however, notably those in which labour saving appliances have been installed, the wages paid are much higher than the average, and shortage of labour is rarely experienced.

The material wants of the Indian coal miner are as yet few, and it must not be concluded that the remuneration given for his labour is insufficient for subsistence. Not only is it sufficient to support life, but it leaves such a margin that he can rest for two or three days in the week and indulge his liking for alcohol; whilst many are enabled to send regular remittances to their homes. The extent of the margin can to some extent be gauged from the fact that during an average month more than three lakhs of rupees are remitted from post offices in the Jharia coalfield, and country spirit to the value of about one-and-half lakhs of rupees is retailed.

*Hours worked and wages paid at a large representative mine in each important mining field in British India.*

Mining Field.	Miners.		Underground males other than miners.		Underground females.		Surface males.		Surface females.	
	Hours worked.	Weekly earnings.	Hours worked.	Weekly earnings.	Hours worked.	Weekly earnings.	Hours worked.	Weekly earnings.	Hours worked.	Weekly earnings.
		Rs.		Rs.		Rs.		Rs.		Rs.
Jharia coalfield (Bihar and Orissa)	40	4-12-0	52	3-12-0	48	2-8-0	60	3-15-0	60	2-7-0
Raniganj (Bengal)	48	3-8-0	48	3-4-0	48	2-0-0	48	2-10-0	48	1-12-0
Giridih (Bihar and Orissa)	48	4-0-0	48	3-4-0	48	2-0-0	48	3-4-0	48	2-0-0
Assam	48	7-8-0	48	6-0-0	..	..	48	4-8-0	48	2-10-0
Punjab	54	7-15-9	60	7-5-9	..	..	60	6-3-9	..	..
Baluchistan	48	7-8-0	48	6-8-0	..	..	54	5-0-0	..	..
Pench Valley (Central Provinces)	33	4-1-6	50	3-0-0	50	2-8-0	55	2-10-0	55	1-11-0
Bihar & Orissa Mica	56	4-12-0	56	2-14-0	56	1-8-0	56	2-14-0	56	1-8-0
Madras Mica	42	2-3-0	42	1-15-6	42	1-5-0	42	2-3-0	42	1-5-0
Central Provinces Manganese	48	3-8-0	48	4-8-0	48	2-4-0	48	2-8-0	48	1-8-0
Madras Manganese	56	2-4-0	..	..	..	..	56	3-8-0	56	1-0-0
Burma Ruby	54	6-0-0	54	6-0-0	..	..	54	8-0-0	..	..
Madras Gold	48	10-8-0	48	4-0-0	..	..	48	11-8-0	42	1-5-0
Bihar and Orissa Iron	44	2-8-3	..	..	..	..	44	4-4-0	38	2-0-0
Burma Lead	43	9-0-0	52	18-0-0	..	..	51	9-4-0	..	..
Burma Tin and Wolfram	36	9-4-0	..	..	..	..	42	8-3-0	..	..

That mining is an unpleasant occupation the Burman has recognised, for nothing will induce him to go underground, and in Burma the underground mines are manned by Chinese and Indians. The view has, however, been frequently put forward that the physical conditions of mining in the Indian coalfields compare favourably with those in other countries. It is claimed that the workings are lofty, the ventilation good and the temperature equable. It is true that there are mines in which these conditions obtain, but the workings are becoming deeper and more extensive, and in the majority of mines the physical conditions are now far from agreeable. There were 942 coal mines at work in 1923, but at no more than 55 of them have ventilating fans been installed, and the air current circulating through the workings is often inconstant and frequently changes in direction at certain times of the day or seasons of the year. The temperature of the mines is gradually increasing, and in many mines humidity is so high that any exertion causes profuse perspiration. There has been a great increase in the use of explosives, and the air in mines is frequently charged with the poisonous fumes which they produce and with smoke from the evil smelling oil lamps commonly used. There is, moreover, an increasing risk of accident, for the number of accidents and of persons killed is increasing at a greater rate than the number of persons employed.

So far there has been no statutory interference with labour conditions in Indian mines, but on 23rd February 1923 the Governor-General gave his assent to a new Mines Act (Act IV of 1923) by which, with effect from the 1st July 1924, no person may be employed underground for more than 54 hours in the week, and no child under the age of 13 years may be employed in a mine or be allowed to be present in any part of a mine which is below ground. As to how far mine-owners have prepared themselves for these changes it may be mentioned that at a recent fatal accident inquiry it transpired that deceased had been at work for 14 hours; the superintendent of a large group of collieries considers that the number of children underground in mines was never so large as at the close of the year.

Proposals have been made for the limitation of the period of a shift to 12 hours, but this reform, though favoured by many mine superintendents, has been opposed by the majority of coal mine-owners for reasons which no doubt appear to them to be sufficient. They have perhaps failed to realise that the cost of the increased supervision imposed by the draft regulations under the new Mines Act will be considerably greater than it need be if it is not arranged for work to be carried on in regular shifts. If no such system is adopted the benefit to be obtained from labour saving machinery such as machine coal-cutters will be largely dis-

counted. In commenting on the Annual Report for 1922-23 of their Chief Inspector of Mines the Mysore Government have remarked as follows :—“ A satisfactory feature of the gold mining industry in the State is that the Mining Companies have of their own accord divided the working day of 24 hours into three shifts of eight hours each, provision being made for longer shifts in case of emergency, which, however, are found by experience to be occasional and not very frequent.”

Proposals to prohibit the employment of women in underground mines have been still more strenuously opposed in certain quarters, but there are many who think that, quite apart from the humanitarian aspect of the question, the exclusion of women from the mines would speedily lead to a reduction of mining costs, and that any temporary disorganization would soon be adjusted. It is perhaps unknown to many that in India no women are employed in underground metal mines, or in coal mines in Baluchistan and the Punjab, and that few are employed in Assam coal mines. They may not know that India is the only country in the world where women work underground in mines. A great deal has been said in favour of the so-called “ family system ” in Indian coal mines, by which the miner gets the coal, and his wife and children carry it to the tub, whilst the latter learn at their parent’s knees how to become miners and carriers themselves. . The “ family system ” however, is not always what it seems, for it is not unusual to find the carrier to be someone else’s wife. However, this may be there is an increasing body of informed opinion which thinks that a mine is no proper place for women and that the output would increase and the cost would go down if women were excluded from the mines.

Miss G. M. Broughton, O.B.E., in her recent book entitled “ Labour in Indian Industries ” dwells on the great contrast between village life and life in the industrial areas. She says “ The absence of family life, the unfamiliarity of the surroundings, the oppression of the sirdars or jobbers, the lack of understanding shown by those over them, the severe strain and the constant menace to health, all tend to make the Indian labourer fear the factory and the mine. Some employers have done what they can to deal with this but too few recognise the acuteness of the problem.” During recent years a great deal has been done by Mines Boards of Health to improve sanitation in the coalfields, and recently a campaign for the improvement of housing has been undertaken by the Jharia Mines Board of Health. Since March 1922, housing regulations have been in force and these are based on a standard specification of 100 square feet minimum floor space and 1,000 cubic feet minimum air space, with doors and verandah. A five-years programme has been arranged and it is hoped that by 1929 all housing will have been brought up to the standard. At the end of 1923, however, out of 46,381 houses only seven per cent. were up to standard dimensions.

## Section II.—Output of Minerals.

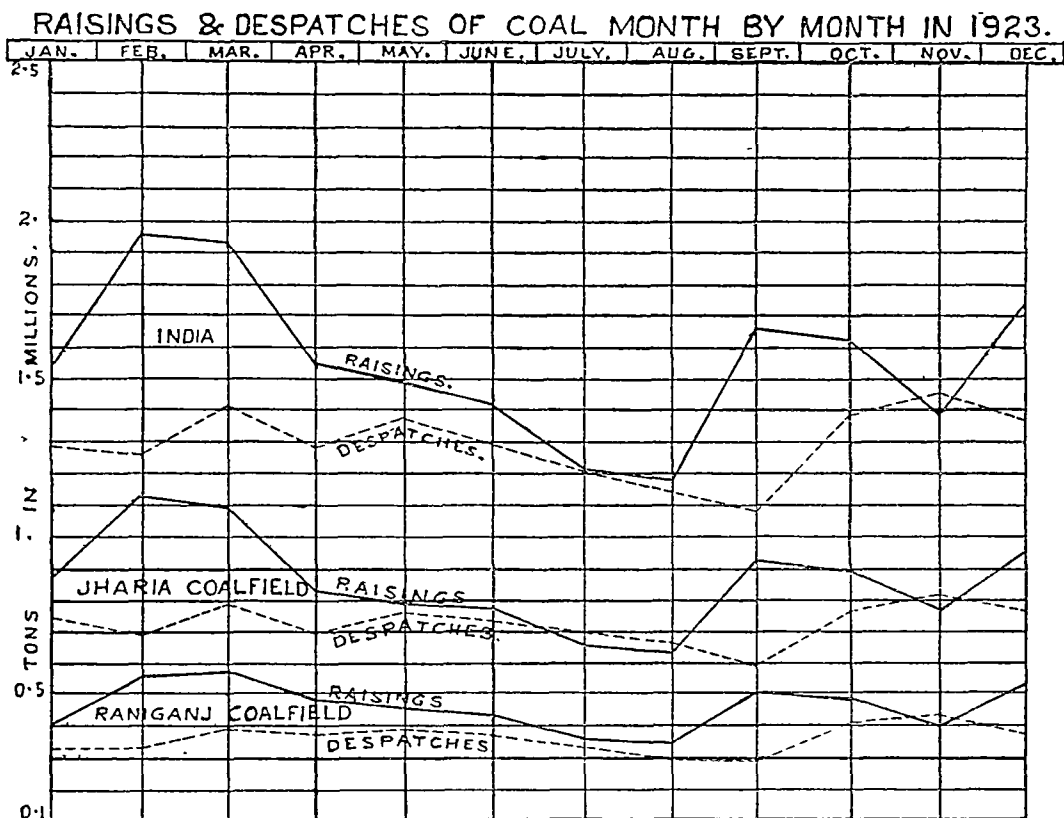
### COAL.

The statement given below shows the output of coal in the various provinces in British India during the years 1922 and 1923 :—

	OUTPUT IN TONS.	
	1923.	1922.
Assam . . . . .	325,949	347,650
Baluchistan . . . . .	31,626	40,632
Bengal . . . . .	4,621,578	4,328,986
Bihar and Orissa . . . . .	13,171,983	12,708,527
Burma . . . . .	1,271	172
Central Provinces . . . . .	548,059	675,841
Punjab . . . . .	63,501	67,180
TOTAL . . . . .	18,763,967	18,168,988

The total output in 1923 was 18,763,967 tons which is 594,979 tons or 3·27 per cent. more than in the previous year, when a decrease in the output of 1·03 per cent. was recorded.

The opening stocks in 1923 were 2,629,202 tons and the closing stocks 3,074,584 tons. In the chart inserted below the raisings and despatches of coal are shown month by month, and the divergence between the raisings and the despatches of coal is seen to be most marked, for in only one month (November) were the despatches greater than the raisings. It will further be noticed that the output of coal varies in accordance with the season, there being a progressive fall in output from April to August, which is the ploughing and sowing season, and a similar drop in November when the rice crop is being gathered.



The total despatches of coal amounted to 15,510,104 tons and 2,356,814 tons were consumed on the collieries. The quantity of coal used for coking at the collieries was 451,667 tons and 82,841 tons of hard coke and 220,061 tons of soft coke were made. At a large number of collieries coal is now despatched from the collieries to coke making plants elsewhere, and this coal is included under despatches. These despatches of coal to coking plants amounted to 762,257 tons in 1923. The figures for coke given in this report relate only to coke made on the collieries.

Analyses of the figures relating to the output of coal and the manufacture of coke will be found in Appendix I, Table II, on pages 42 and 43.

The increase of output in Bihar and Orissa was 463,456 tons, and in Bengal 292,592 tons, but in every other province except Burma, where the output of coal is negligible, there were small decreases, that in the Central Provinces being as much as 127,782 tons. Figures of output for the two principal coalfields are as follows :—

	OUTPUT IN TONS.		Percentage of increase.
	1923.	1922.	
Jharia Coalfield . . . . .	10,346,015	9,936,299	4·12
Raniganj Coalfield . . . . .	5,557,424	5,203,214	6·81

It should be remembered that although the Raniganj coalfield is chiefly in Bengal a considerable part of it is in the province of Bihar and Orissa.

During the past year efforts have been made to recover the lost export trade by means of reduced production costs and transport charges. An export rebate of Re. 1 per ton on coal shipped *via* the Kidderpore docks has been re-introduced, and the Port Commissioners have made certain minor reductions in their charges. In spite of the large sums being spent on the railways very little improvement in transport facilities was apparent, and producers had great difficulty in keeping their stocks within reasonable bounds.

For the greater part of the year the Central Provinces coal trade continued to experience, but in an accentuated form, the depressed conditions with which it was faced at the close of 1922. Heavy importation of foreign coals into Bombay with poor internal trade conditions generally were reflected in the abnormally low prices at which certain classes of Bengal coal were offering, making it only possible to sell Central Provinces coal on a restricted scale, mainly to local industries and at rates below cost of production. Owing to the accumulation of heavy stocks collieries had either to shut down for several months or severely to curtail operations. The condition of the trade improved in the last quarter of the year consequent on a fair seasonal demand from ginning factories and the fact that a more favourable schedule of railway freights enabled the coal to be marketed further afield.

At 91 coal mines electric power was used, the aggregate horse power employed being 36,008. The number of coal cutting machines in use increased from 43 to 93, of which 70 were driven by electrical power and 23 by compressed air. Forty-four machines were at work in the Jharia coalfield, 42 in the Raniganj coalfield, 1 in the Bokaro coalfield, 3 in the Central Provinces and 3 in the Punjab. These machines under-cut a total area of 3,230,584 square feet, and, assuming that the thickness of coal worked averaged 9 feet, the quantity of coal got by machines was not less than one million tons or rather more than 5 per cent. of the total output. In Appendix I, Tables 6, 7 and 8, statistics are given of the electric plant in use at mines in the various provinces of British India and in particular mine fields.

During the last five years there has been a remarkable increase in the use of explosives in coal mines. In 1919, 424,022 lb. of gunpowder and 228,365 lb. of high explosives were used, whilst in 1923, 1,643,161 lb. of gunpowder and 328,031 lb. of high explosives were used; the latter includes 19,981 lb. of "permitted explosives" on the British Board of Trade list. The quantity of gunpowder used, therefore, has increased nearly four times in four years, whilst that of high explosives has increased by one-half. This large increase in the use of explosives was not accompanied by a larger output, for the output in 1923 was three million tons less than the output in 1919. The increase is due to the introduction of coal cutting machinery and to the desire to maintain output in spite of a shortage of labour.

At two collieries in the Jharia coalfield underground haulage is now being effected by means of electric locomotives. At another colliery in the same coalfield a bye-product coke plant of the most improved modern design was brought into use and the surplus gas obtained in the process of coking is used to drive gas engines for the production of electric power, and the waste heat is used for raising steam in boilers. At this colliery a thick seam of coal is being worked by a method in which the excavation is filled up with sand so as to avoid subsidence. During the year arrangements were made for the introduction of this system at another large colliery situated some two miles from the Damodār river. An aerial ropeway has been erected for transporting the sand from the river to the colliery.

#### MICA.

The output was 31,605 cwt. as compared with 30,089 cwt. in 1922. There was thus an increase of 5.04 per cent. The increase came entirely from mines in Madras where following on a period of great stagnation the output increased from 1,298 cwt. to 8,814 cwt. The demand for the better qualities of green stained mica increased and several discontinued mines in the Nellore district where that quality of mica is obtained were re-opened.

## MANGANESE ORE.

There was a considerable increase (39·27 per cent.) in the output of manganese, the figures being 546,378 tons, as compared with 392,322 tons in 1922. The demand that set in during the latter half of 1922 continued during the year under review, increasing towards the end of the year, when both high and low grade ores were in strong demand. The average price of manganese ore during the year was 10½ d. per unit., *f. o. b.* Bombay or Calcutta, which marked a further improvement on the price ruling in 1922. Ocean freights were slightly higher, the average during the year being 21s. 6d. per ton. In view of the limitations of opencast workings underground development of some of the important deposits is being vigorously carried on.

## ROCK-SALT.

The output of rock-salt was 113,700 tons, as compared with 187,157 tons in 1922. The low output is said to have been due to weakness of demand.

## LEAD-SILVER ORES.

The output of lead-silver ores from the Bawdwin mines in the Northern Shan States, Burma, was 245,892 tons in 1923, as compared with 172,017 tons in 1922. The increase was, therefore, 42·95 per cent. There was a production of 44,551 tons of refined lead, 1,508 tons of antimonial lead, and 4,843,939 ounces of refined silver. In addition, 1,220 tons of copper matte and 4,548 tons of zinc concentrates were produced for shipment. The average prices obtained were Rs. 372-4-4 per ton of refined lead and Rs. 215-0-0 per ounce of refined silver.

## WOLFRAM AND TIN ORES.

There was a decline of 7·43 per cent. in the output of wolfram. The figures were 872 tons, as compared with 942 tons in 1922. The output of tin ore fell from 1080 tons in 1922 to 1,021 tons in the year under review. No mines were worked for wolfram alone during the year. The price of wolfram remained nominal at 12s. 6d. per unit. During the year the price of tin increased from £180 5s. 0d. to £234 10s. 0d. per ton. Twenty-four mines were worked for tin and seventeen mines for tin and wolfram.

## GEMS.

The output of gems decreased by 19·10 per cent., the figures being 187,010 carats, as compared with 231,160 carats in 1922. The quantities of each gem mined were as follows :—

	Carats.	Cwt.
Rubies . . . . .	92,592	...
Sapphires . . . . .	65,692	..
Spinel . . . . .	28,726	..
Hyalite (a transparent form of opal) . . . . .	..	12½

In spite of the decrease in the weight of gems mined, the value was very little less. There was a continued demand for rubies of fine quality in London where they are largely re-sold to New York and Paris; a considerable trade with Paris direct is also carried on by local dealers in Mogok where the Burma ruby mines are situated. The fine ruby of 22¾ carats from the Enjouk mine was cut in London yielding beautiful stone of 11·22 carats which sold for £4,000, and was afterwards resold in Paris. The Enjouk mine still continues to produce the best stones and the earth there is the richest that the Burma Ruby Mining Company has ever washed.

“Native mining” showed a slight decrease. The monthly average number of “native miners”, each of whom pays a license fee of Rs. 20 per month, was 662,



**GOLD.**

There was a further heavy fall in the output of gold ; only 1,519 ounces were produced. The price obtained varied from Rs. 66-4-11 to Rs. 67-4-5 per fine ounce.

**COPPER ORE.**

The output of copper ore fell to 6,550 tons, as compared with 30,764 tons in 1922. At the end of March the operations of the Cape Copper Company, Limited, at their Rakha Hills mines in the Singhbhum district ceased. There was, however, vigorous development at an adjacent property owned by another Company, but it is not expected that this latter Company will be in a position to produce copper for at least two years. The value of the copper produced was Rs. 1,230 per ton, as compared with Rs. 1,201 per ton in the previous year.

**IRON ORE.**

The production of iron ore was 292,033 tons, as compared with 240,383 tons in 1922, the increase being 21.49 per cent. These figures, however, do not include the iron ore used at the Jamshedpur Steel Works, supplies for which are obtained from mines in an Indian State which do not come under the operation of the Indian Mines Act.

**CHROMITE ORE.**

The output of chromite was 25,233 tons, as compared with 19,695 tons in 1922. The increase was therefore, 28.12 per cent.

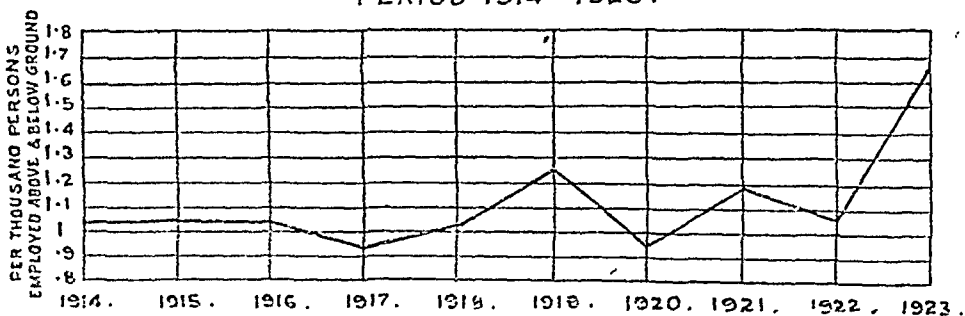
**OTHER MINERALS.**

There were increases in limestone, steatite, apatite, bauxite, magnesite, barytes and ochre, and decreases in clay, fuller's earth and slate.

**Section III.—Accidents.**

During the year 1923 at mines regulated by the Indian Mines Act, 1901, there were 237 fatal accidents, being an increase of 32 on the number which occurred in 1922 and an increase of 22 on the average number in the preceding five years.

**CHART SHOWING THE GRADUAL INCREASE  
IN THE DEATH RATE FROM ACCIDENTS DURING THE  
PERIOD 1914 - 1923.**



These accidents involved the loss of 387 lives or 144 more than in 1922. Of these persons 297 were males and 90 females. Last year only 25 females were killed and the figure for this year is a record and is nearly 50 per cent. higher than the figure in 1919 when 62 females were killed. In five separate accidents the number of lives lost was 74, 16, 9, 8 and 6, respectively. In two cases 7 lives, in two cases 5, in two cases 4 and in sixteen cases 2 lives were lost. There were in addition 320 serious accidents involving injuries to 344 persons.

The causes of the fatal accidents have been classified as follows :—

	Number of fatal accidents.	Percentage of total number of fatal accidents.
Misadventure . . . . .	112	47.26
Fault of deceased . . . . .	89	37.55
Fault of fellow workmen . . . . .	7	2.95
Fault of subordinate officials . . . . .	14	5.91
Fault of management . . . . .	13	5.49
Faulty material . . . . .	2	0.84
TOTAL .	237	100.00

The improvement recorded last year in respect of fatal accidents from falls of roof and sides was not maintained, for there were 133 such accidents, as compared with 109 in 1922. The number was, however, still below that recorded in 1921 when there were 136 fatal accidents of this class. The fact that less pillar cutting is being done in the coalfields should tend to check the upward tendency. So many mine fires have followed upon pillar cutting operations that many mine-owners and superintendents have preferred to maintain output from quarries and from gallery drivings in solid coal rather than to run the risk of losing property through fire. Many of the accidents were due to persons working in prohibited places and it may be that when the miner has realised that where there is proof of this neither he nor his relatives will be entitled to benefit under the Workmen's Compensation Act these avoidable accidents will become fewer. Improvement should result when the new regulations come into force. At present the law requires an inspection every 24 hours, but under the draft regulations it will be necessary for every working place and travelling road to be inspected twice in each shift, and in the case of continuous shifts every five hours. At the present time supervision in a number of mines is far from continuous, and from time to time in the course of inquiries into accidents it transpires that shifts, particularly at night time, have worked entirely without supervision. The great thickness of the seams renders difficult the examination of the roof and sides in Indian coal mines and calls for constant vigilance.

There were 26 fatal accidents in shafts, the same as in the previous year. Four of them took place at a single metal mine in Singhbhum where it had not been realised that fencing which may possibly be sufficient where the labourers are drawn from an educated class, and are, as a rule, skilled men is not sufficient to prevent accidents to the class of labourers employed at Indian mines.

There were 29 fatal accidents on haulage roads, as compared with 20 in 1922 and 30 in 1921. Each of them caused the loss of a single life. In thirteen cases the accidents were due to runaway tubs, and in eight cases to crushing between wagons or tubs and the sides of the haulage roads. From the casual manner in which persons sit about on haulage roads in Indian mines it is surprising that there are not more accidents.

There were only two fatal explosions of fire-damp or coal-dust, but seventy-five persons were killed. One of the accidents occurred in the deepest coal mine in India where an explosion of coal-dust caused the death of 74 persons (see page 10).

As in the previous year the number of fatal accidents from explosives was nine. Eleven lives were lost. This, however, does not take into account eight accidents at coal mines by which twenty-five persons were killed and five persons were injured by explosions of gunpowder in or about miner's dwellings. Formal inquiries were held into the circumstances of these accidents, but, as there are

no rules under the Indian Mines Act regulating the storage and use of explosives before they are taken into mines, they have been placed on the non-statistical list, it being considered that they come under the Explosives Act. By the new draft mining regulations the irregular practices which brought about these accidents are prohibited.

There were three fatal accidents caused by suffocation of gases, and they caused the loss of twelve lives. In two of the accidents the deceased were overcome by the gases generated by underground fires.

Three accidents causing a death in each case were due to electricity. In two of the accidents the deceased climbed towers carrying electric transmission wires and were electrocuted.

The death rate per thousand persons employed above and below ground was 1·65, while that of the preceding five years was 1·10. At coal mines only the rates were 1·82 and 1·19, and at mines other than coal 1·05 and 0·78. At all mines under the Coal Mines Act in Great Britain during the ten years ending with and including 1922 the average death rate per thousand persons employed was 1·15, as compared with 1·18 for Indian coal mines.

The gradual increase in the risk of accident is lamentable. It is due to the increasing dangers of deeper and more intensive mining and a greater use of machinery. The training of new workers should receive more and more careful consideration, for during the first few weeks of employment miners are more liable to accident than later when they have become accustomed to working conditions.

The death rate per million tons raised at coal mines was 17·69, while that of the preceding five years was 11·50. At mines under the Coal Mines Act in Great Britain during the ten years ending with and including 1922 the death rate per million tons raised was 4·92.

Comparative death rates in coal mines in Great Britain, the United States of America, and India in 1922 are given below :—

	No. of persons killed per thousand persons employed in coal mines in 1922.	No. of persons killed per million tons of coal mine in 1922.
Great Britain . . . . .	1·09	4·32
United States of America . . . . .	4·89	4·65
India . . . . .	1·13	11·50

Deaths occurring in each class of mine were as follows :—332 in coal mines, 16 in silver-lead mines, 10 in mica mines, 6 in iron mines, 5 in tin mines, 5 in manganese mines, 4 in a copper mine, 3 in wolfram mines, 2 in clay mines, 1 in a slate mine, 1 in a salt mine, 1 in a chromite mine and 1 in a magnesite mine.

Seventy-five persons lost their lives by explosions of gas, 92 by falls of roof, 101 by falls of side, 32 in shafts, 12 by suffocation by gases, 11 by explosives, 29 by haulage, 13 by other accidents underground and 22 on the surface.

A list of these fatal accidents appears in Appendix II, Table I. In addition to these there were 41 other fatal accidents causing the death of 62 persons. These also appear in Appendix II, Table I, but are listed separately, reasons being given in each case for their exclusion from the statistical table.

Each fatal accident is described briefly in Appendix II, Table I, but the following are reported at greater length. The numbers refer to the numbers in the Appendix.

#### EXPLOSIONS OF FIREDAMP OR COAL DUST.

*No. 1.—The Bengal Coal Company, Limited's Parbelia coal mine.*

Up to the present the unfavourable record for loss of life by a single mine accident in India was held by the Kolar gold field in Mysore where, in 1897, 52 persons were killed by an accident in a shaft. The record for British India was

held by the Khost coal mine in Baluchistan where, in 1899, a mine fire following a slight explosion of gas caused the loss of 47 lives. These records are, however, far exceeded by the disastrous explosion at Parbelia colliery which took place on 4th January 1923 and resulted in the loss of 74 lives.

The Parbelia mine is the deepest coal mine in India. It is situated in that portion of the Raniganj coalfield which extends into the province of Bihar and Orissa. It consists of two shafts sunk to the Dishergarh seam at a depth of almost 1,500 feet. The seam is just over 15 feet thick, and dips from north to south at a gradient of 1 in 5. The mine was in the preliminary stage of development, and the workings consisted of little more than a pair of connected level galleries driven some 600 feet to the east and 400 feet to the west of the shafts as shown in plan A. Owing to a change in the direction of the dip a change in the direction of the east levels had been made. At the innermost end of the eastern workings there are some narrow galleries which were driven to secure rapid development, but the cutting of these galleries was stopped in May 1922 owing to the difficulty of ventilating them properly. It was in one of these narrow galleries (No. 4 dip gallery) that the explosion is considered to have originated.

The mine is comparatively dry, and inflammable gas had been found in the workings from time to time. On 5th July 1922 an explosion ascribed to an ignition of firedamp by a defective safety lamp took place in the rise workings on the east, and caused the death of four miners. Safety lamps had always been used in the mine, but after the July explosion an improved type of lamp with double gauzes was introduced. In October 1922 an electrically driven coal cutting machine was first brought into use. From that time Viking powder No. 1, an explosive on the British Home Office "Permitted" list, was exclusively used, and the management, alive to the possible dangers from inflammable gas and coal dust, drew up and enforced a code of blasting rules considerably in excess of the requirement of the rules made under the Indian Mines Act. Between each round of shots the floor was watered by hand from tins, and a small hand pump was provided for spraying roof and sides. A more powerful electrically driven pump was on the point of being brought into use when the explosion occurred.

The ventilation at the time of the explosion was by natural means, the air entering by No. 1 (downcast) shaft and passing to east and west, being conducted round the workings by stoppings and brattices in the manner shown on plan A. The velocity of the air in the narrow part of No. 4 dip gallery was found by experiment after the explosion (before the stoppings in the connected galleries and the brattice cloth had been repaired and before the fan was started) to be 315 feet, the quantity passing being 4,100 cubic feet per minute. At the time of the explosion the velocity must have been greater. A fan of large capacity had been installed, but had not been started as the air current produced by natural means was considered to be sufficient.

At the time of the explosion 80 persons were below ground. Of the six survivors five were in the western workings and one was sitting at the foot of No. 1 shaft. The evidence of the survivors in the western workings was to the effect that there was an explosion which knocked them down and extinguished their lamps; only one of them stated that he heard blasting before the explosion. Kaloo Singh who was sitting at the bottom of the shaft said that he had been working the coal cutting machine, and, having finished a cut in No. 4 dip gallery, was taking the machine towards the main level when the electrical current failed, and shortly after a man came down who told him that one of the switches in the sub-station on the surface had gone wrong. After changing some of the picks in the machine Kaloo Singh went to the shaft, and, while waiting to be taken up, saw smoke rushing up the shaft and after that flame which enveloped him and the other men who were with him. He jumped into the sump at the bottom of the shaft in which there was about 1½ feet of water and was subsequently rescued practically unharmed.

The explosion occurred at 7 A.M., and before midday rescue parties had removed from the mine all of the injured. The seventeen bodies of those who had been killed outright were brought up the same evening. Of the fifty-eight injured fifty-one had died by the following morning and six more subsequently died. Signs of violence were few and the injured appeared in every case to have succumbed from shock and exhaustion due to severe burns.

The subsequent examination of the mine disclosed the fact that at the time of the explosion a shot had been fired in No. 4 dip gallery, and that the end of the shot hole had blown through into the narrow heading driven in advance (see Plan B). In most parts of the mine there was a thin layer of small coal and dust, from  $\frac{3}{4}$  to 1 $\frac{1}{2}$ " thick, lying in the galleries, and coking of this coal and even of the sides of the galleries was clearly noticeable. This was most evident in the wide part of No. 4 dip gallery, and it was evident also in patches right along No. 1 main level towards No. 1 shaft. In the narrow part of No. 4 dip gallery there was a sooty deposit, and a cake of coked small coal was found on a ledge in the roof where the narrow gallery dips. Coking was again evident where the narrow joins the wide gallery in No. 2 main level, but the signs of burning decreased along this level towards No. 2 shaft. Except for slight damage at the top of both the shafts and at the bottom of No. 1 shaft there was not much evidence of force. On the day following the explosion tests for gas were made in No. 4 dip gallery and in the narrow galleries beyond, but no gas was found. On January 7th, gas was found in No. 2 main level about 65 feet from the face, and gas was heard issuing on the same day from the machine cut on the left side of No. 4 dip gallery. On January 11th, gas was found in No. 3 rise about 60 feet from the face. Two samples of air from the air current in the narrow part of No. 4 dip gallery and No. 2 main level were analysed, but no trace of firedamp was found.

An inquiry, under Section 18 of the Indian Mines Act, was ordered by the Local Government and was entrusted to the Deputy Commissioner of Manbhum with the Chief Inspector of Mines and the Colliery Superintendent to the East Indian Railway as assessors, and the following is an extract from their report:—

"The signs of burning were, therefore, most evident in No. 4 dip gallery and from there they become less noticeable towards the two shafts. This gallery would, therefore, appear to have been the seat of the explosion. As to the cause of the explosion various alternatives are possible. It is highly improbable that the explosion was due to anyone lighting a match underground. The miners are searched for matches before they go down and all the evidence goes to show that the explosion did not originate at the place where the dead and dying were found. The possibility of a defective lamp may also be rejected, for inspection showed that all the lamps found near the seat of the explosion were in good order. It is also clear that the explosion was not due to defective working of the electrical apparatus because the current had been cut off at 4 A. M., and had not been restored when the explosion took place. When these possibilities have been eliminated it is sufficiently clear that the explosion was caused by some mishap in connection with the blasting in No. 4 dip gallery, and the inspection of the mine leaves little doubt as to what occurred. The shot hole on the right should not have been bored to a point immediately beneath the floor of the narrow gallery. It is true that a so-called flameless explosive on the 'Permitted' list of the British Home Office was used and that the maximum charge ever detonated in this mine was stated to be 10 ounces, as compared with a maximum permissible charge in England of 26 ounces: but we consider that when the shot was fired it followed the line of least resistance and blew through into the narrow gallery, shattering the coal and projecting a stream of burning particles into the air. An explosion would then be caused by the volatile gases in the shattered coal and dust being liberated and ignited by the heat. This initial explosion would raise clouds of fine dust sufficient to feed the flame and carry the explosion to all places where there was a sufficiency of dry coal dust. The explosion must have swept back along the two main galleries, passing the men who were waiting to return to the gallery after the shot had been fired and losing force as it approached the bottom of the shafts. It has been experimentally proved that a coal dust explosion can occur without gas; but if gas was there, even in a quantity that could not be detected by the lamp, a much more inflammable mixture would be caused. Whether gas was present on this occasion it is impossible to say; the velocity of the air in the narrow passage would be sufficient to prevent any accumulation, but it is just possible that gas had been released in small quantity by the shots fired on the left hand side of the face. According to the company's rules tests for gas are made before each separate shot is fired; this rule is always followed and it is reasonable to suppose that the precaution was taken before the firing of the fatal shot and that, if any gas had been found, the shot would not have been fired.

If then gas was present at all, it can have been present only in a very small quantity. In any case gas did not play an important part in the explosion. The accident was in our opinion caused by an explosion of coal dust due to a faultily placed shot.

*Responsibility for the explosion.*—The marking off and the boring of shot holes is done by the shot firing sirdars under the supervision of the assistant manager or, when he is absent, of the overman. Rule 1\* of the company's rules was framed at the time when there was only a day shift; when a night shift was started as well as a day shift and it was impossible for the assistant manager to be present throughout the 24 hours, the responsibility was divided in this manner. At the time of the explosion the assistant manager was above ground and the responsibility therefore rests with the shot firing sirdar and the overman, both of whom were killed. The Assistant Manager says that in order to avoid blown through shots the shot firers had been told not to bore within 2 feet of the openings of the narrow galleries and always to bore holes bearing away from them. The manager also says that they had been warned not to bore close to the openings of the narrow galleries. It is in fact surprising that the sirdar, who was an experienced man drawing a considerably higher pay than a sirdar usually draws and the overman, who had some 2 years' experience did not realize the danger of giving the shot insufficient work to do by boring close to the narrow gallery.

In order to provide safeguards in the working of this mine the company had gone considerably beyond what was required of it by law and what is done in other mines in India and, but for the misfired shot, the precautions taken would have been sufficient to prevent an explosion. After very careful consideration we do not think that blame for what occurred can properly be attached either to the company or to the superior staff of the colliery.

*Recommendations.*—At the same time the disastrous effects produced by the blowing through of the shot on this occasion have in our opinion made it clear that still more stringent precautions should be taken in future. We recommend, therefore, that for the time being the following rules, which include and supplement the company's rules, shall be put into force in this mine:

(1) The floor, roof and sides of the air ways, haulage and travelling roads and working places shall be systematically cleared so as to prevent, as far as practicable, coal dust accumulating, and such coal dust shall be sent out of the mine.

(2) Precautions shall be taken so that fine coal dust is prevented, as far as practicable, from passing into the mine with the air current.

(3) All airways, haulage and travelling roads and working places shall be treated in one of the following ways:—

(a) they shall be treated with incombustible dust in such manner, and at such intervals, as will ensure that the dust on the floor, roof and sides throughout shall always consist of a mixture containing not more than 50 per cent. of combustible matter;

(b) they shall be treated with water in such manner, and at such intervals, as will ensure that the dust on the floor, roof and sides throughout is always combined with 30 per cent. by weight of water in intimate mixture; or

(c) they shall be treated in such manner as the Chief Inspector of Mines may approve.

(4) The incombustible dust used for the purposes of this rule shall be of such fineness that 50 per cent. of it by weight will pass through a sieve with 200 meshes to the lineal inch (40,000 to the square inch); provided that if a larger proportion of incombustible dust is used than is required by the foregoing rule, the percentage of fine materials may be reduced proportionately, but shall not fall below 25.

(5) The incombustible dust used for the purposes of this rule shall be prepared from shale or other material containing no injurious free silica.

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\* RULE 1.—No shot-firing is permitted unless under the personal and direct supervision of the European under-manager who will be held responsible for the safety of the gallery, place, district or mine while shot-firing is being carried out.

(6) The coal tubs shall be so constructed and maintained as to prevent, as far as practicable, coal dust escaping through the sides, ends or floor of the tubs.

(7) No explosive shall be used other than a "permitted" explosive on the British Home Office list.

(8) As far as practicable all blasting shall be done between shifts or when there is a minimum number of persons in the mine.

(9) No shot shall be fired unless all roads within 50 yards of the place of firing have been treated as laid down in (3).

(10) No shot shall be fired in coal which has not been undercut, overcut or sidecut. The length of the shot hole shall be at least 6 inches less than the length of the cut.

(11) No shot shall be fired unless the charge is at least three feet from an open face in any direction.

(12) No shot shall be fired within 50 yards of any place where gas has been found within the previous 36 hours.

(13) Not more than one shot shall be fired at one time, and immediately prior to the firing of each shot a careful test for firedamp shall be made by a competent person at the place where the shot is to be fired.

(14) No shots shall be stemmed or fired save by, or under the personal directions of, a competent person authorized by the manager, in writing, for the purpose.

(15) No unauthorized person shall have in his possession explosives or detonators.

(16) A written record shall be kept giving full details of the number of shots fired, the places in which they were fired, the quantity of explosive used in each hole, and the number of misfires. The record shall be written by the shot firer or in his presence and on his personal report: it shall in every case be signed by him.

Experience in coalfields outside India has conclusively proved that coal dust is explosive even in the absence of fire-damp. The danger of explosion is greatly increased by the presence of fire-damp and the freedom from fire-damp of most Indian mines has hitherto made the danger arising from the presence of coal dust alone of comparative unimportance. With the introduction of coal cutting machinery which produces dust in greater quantity and of finer consistency than the old system of hand cutting, this danger has become one that must be guarded against. The danger is not confined to this colliery or to this province, and the facts established by this inquiry are an insufficient foundation on which to base recommendations of universal application, even if it was within the terms of our reference to make them. We are, however, of opinion that the time has come when the danger arising from coal dust in Indian mines should be systematically considered by a representative committee authorised to conduct such experiments and make such inquiries as may be thought necessary."

In Resolution No. 780-Com., dated 27th March 1923, the Government of Bihar and Orissa, in the Revenue Department, reviewed the report of the Committee of Inquiry, and the last paragraph of the Resolution reads as follows:—

"The Governor in Council desires to acknowledge the care and thoroughness with which the committee of enquiry has carried out its task, and accepts the conclusions reached. The local Government will take up immediately with the Chief Inspector of Mines and the Bengal Coal Company the question of bringing into operation the rules suggested in the report; and in submitting the report to the Government of India will draw special attention to the concluding paragraph in which the necessity of further investigation into the dangers arising from coal-dust in Indian mines is emphasized. His Excellency in Council desires to take this opportunity of expressing his deep regret at the lamentable loss of life which occurred and his sympathy with the relatives and dependants of the victims."

As the result of the recommendation made in the last paragraph of the report the Government of India appointed a Committee to investigate the dangers arising from coal-dust in Indian mines. Information as to the constitution of the Committee and its terms of reference are given on page 26.

#### FALLS OF ROOF.

##### *No. 24. Rai Sahib H. Verma and M. Kanhaiyalal, Limited's Rawanwara coal mine.*

This accident in which fifteen persons lost their lives by the collapse of a mine is a striking example of the evil effect which may follow when an unsystematic method of mining is adopted. At the Rawanwara colliery a coal seam from 3 to 4 feet in thickness, dipping at 1 in 5, was being worked by means of inclines from the surface. The maximum thickness of the strata overlying the coal seam is about 60 feet, and, except for a few feet immediately overlying the seam, the strata are soft and weak. The method of working was to drive galleries, 8 feet wide, forming pillars, 40 feet square, and subsequently to split the pillars, in two directions, thus forming smaller pillars, 16 feet square. At a later stage the smaller pillars were reduced to the smallest dimensions considered possible consistent with safety. During these operations props were used to support the roof. The abandoned workings eventually collapsed, but presumably there was sufficient warning to prevent loss of life. The area of the workings was some 600 feet by 450 feet, and about three-quarters of it had collapsed and was abandoned.

In October 1921 an inspection of the remaining area of workings was made by a Junior Inspector of Mines, and the Inspector of the Circle subsequently wrote complaining of the condition of the mine. Shortly after and apparently as the result of this correspondence the working of the mine was discontinued. The mine was re-opened on 13th March 1923, and working was confined to the reduction of pillars near No. 3½ incline, (see Plan C). At that time the road to No. 4½ incline, the only alternative outlet, was dangerous as the support afforded by the small pillars was insufficient.

On 14th April 1923 an overman inspected the workings at about 8 A. M., and gave orders to the contractor for props to be set up preparatory to taking out a small pillar of coal. He did not notice any signs of crushing of the pillars, nor did he think that there was any immediate danger of collapse. At about 10 A. M., the contractor re-entered the mine with two timbermen for the purpose of setting up the props. Before he went he told the rest of his gang to remain outside the mine until the timbering had been completed. Consequently a group of fourteen persons remained sitting in the shade in the cutting of the incline. Suddenly at about 10 A. M., an area of the workings, measuring 180 feet by 125 feet collapsed. A terrific blast of air through No. 3½ incline followed on the subsidence. The extraordinary violence of this blast may be judged from the fact that fourteen people were lifted into the air and thrown a distance varying from 20 to 200 feet. Eleven of these persons were killed outright and three injured of whom one subsequently died of his injuries. Shortly after the collapse a rescue party entered the mine, and found that one of the three men who were in the mine at the time of the collapse was still alive. They could hear him pleading to be got out, and they began digging their way towards him. They got in for a distance estimated to be 16 feet and thought that they were within a few feet of the men when they were obliged to desist owing to the insecurity of the roof. At about 2 A. M., a fall occurred closing the excavation which they had made and even extending the area of the original collapse. After this fall they could get no answer from the entombed man and, believing that he was dead, work was given up for the day. On the following morning a fresh attempt to reach the buried men was made by the same workers, but after excavating for 10 feet they gave it up as hopeless. After dark on the same day a rescue party organised by the European officials of adjacent collieries continued the work, and at about 4 A. M., on the following morning the body of the contractor was found. As the work was highly dangerous and it was almost certain that the entombed men were dead the rescue operations were then discontinued.

Under instructions from the Government of the Central Provinces a formal inquiry under Section 18 of the Indian Mines Act was opened on April 23rd by



the Deputy Commissioner, Chhindwara, assisted by the Officiating Chief Inspector of Mines in India as assessor. The following are extracts from their report :—

“ We are satisfied that the rescue party worked with the highest degree of skill, and that they persisted in their effort to a point of danger at which it would have been unjustifiable to run further risk. \* \* \* \* \* We regret to record that, in our opinion, the main cause of the accident was faulty working. The system of coal extraction followed is that known as “ Pillar and Stall”. In order to render this system safe from a subsidence which might bury the workmen it is necessary that pillar cutting should proceed only where there are pillars large enough to avoid an extension of any subsidence to the spot where work is proceeding. In our opinion this fundamental precaution was not observed at the mine where the accident occurred. The pillars had been reduced in a wholesale fashion, and when a collapse did occur it extended over the pillars at which work had been proceeding on the previous day, and in the vicinity of which the three unfortunate men who were trapped were at work. \* \* \* \* \*

The overman and contractor undoubtedly thought the work-people were perfectly safe at the mouth of the incline. It is not likely that it ever occurred to the management that in the event of a collapse of the workings an air blast might result which would endanger the lives of people outside the incline. We do not, therefore, hold the staff of the mine culpably responsible for the deaths caused by the blast. \* \* \* \* \*

The occurrence, however, shows that an air blast ought always to be considered a possibility in mines in which pillar extraction is proceeding and in which large subsidences may occur, and we consider that this aspect of the question should be made public so that mine-owners and managers may be warned to be on their guard against bringing about conditions which might possibly lead to large air blasts. In particular it is good practice, for various reasons, to limit the extent of an unsubsidised goafed area by bringing down the roof at suitable intervals. \* \* \* \* \* Serious failures to comply with regulations have been found on the part of certain individuals. We feel that criminal prosecution should follow.”

Criminal proceedings were instituted against the owner, the manager and the former manager of the mine, and they were convicted and punished as detailed in Section IV “ Prosecutions and additions to the Act”.

*No. 29.—The Equitable Coal Company, Limited's Dishergarh East coal mine.*

In this mine large areas of a coal seam, 15 feet in thickness, have been abandoned owing to the crushing of coal pillars of insufficient size. Efforts have been made to recover some of this coal in areas where the crush has not been followed by the collapse of the roof. In an area of this kind a gang of miners was engaged in loading coal which had fallen from the pillars, when the cracking of the roof gave warning that a fall of roof was imminent, and they ran out. One of them, however, was caught by the falling stone and killed. The mass of roof which fell was 50 feet in length by 10 feet in width and 3 feet in thickness, and it completely buried six tubs which the coolies had been loading. The width of the gallery was 20 feet and the galleries in the vicinity were as much as 26 feet in width, and were in fact wider than the pillars between the galleries. The roof was timbered with props, but in workings such as these it is safer if cogs are set up in all wide places as they are much more effective than individual props. In this case the management agreed to make a larger use of cogs.

*Nos. 61 and 63.—The Standard Coal Company, Limited's Benahir coal mine and the Standard Coal Company, Limited's Jharra Khas coal mine.*

These two accidents occurred within one week at adjacent collieries worked by the same owners. They took place in the same coal seam. In the first accident five persons were killed and one injured by a fall of roof stone, 12 feet by 7 feet by 9 inches thick, at the junction of two galleries, 24 feet high and 16 and 21 feet wide, respectively. The stone fell from “ slips ” in the roof which could not readily be detected owing to the great height of the gallery. In the second accident five persons were killed and two injured by a fall of roof coal. The scene of this second accident is illustrated in Plan D. Pillars of coal, 24 feet high, were being extracted under a roof of exceptional strength. Such confidence had the management in the strength of the roof that miners were permitted to work in

a gallery from 25 to 35 feet in width, with no more artificial support than that afforded by two or three props. This, however, it may be stated, was not in the immediate vicinity of the goaf, but adjacent to a solid barrier. At one end of this working place a small fault traversed the seam and caused a weakness in the roof. The weakness was detected by the officials, and that portion of the working place affected was fenced off. The fence erected, however, appears to have been of a flimsy character and insufficiently supported, and no responsible person remained on the spot to prevent workers from returning to the place. A large quantity of loose coal brought down by blasting was lying there, and to the deceased, who were paid by the quantity of coal got, this proved too great a temptation, for they entered the place and soon after were buried and killed by a mass of some 25 tons of coal which fell from the roof.

Although it was not considered that there had been criminal negligence, yet both these accidents were classed as due to "fault of management." In the second case it was thought that the precautions taken to prevent persons returning to an unsafe place were insufficient. In both cases it was considered that throughout the whole of the districts in which the accidents occurred unnecessary risk was being taken by driving galleries exceptionally wide. The widths varied from 16 to 25 feet, the average being probably not less than 21 feet. Owing to the great height of the galleries the daily examination of the roof presents difficulties. Iron-shod bamboo sounding poles were provided, but owing to their great length and weight they could only be used with difficulty, and a complete daily examination by sounding with these poles was impracticable, and in most cases no more than a visual inspection of the roof was made.

The management agreed that in future no gallery will be permitted to exceed 18 feet in width, and that "all areas adjacent to depillaring sections will be treated, inspected, timbered and secured as if they formed part of the actual depillaring area." They have introduced a novel system of roof testing. Platforms, 14 feet in height, have been mounted on flat trolleys, and from these platforms the officials are enabled to reach and test all parts of the roof with a sounding pole of reasonable length. By virtue of the trolley-mounting the platforms can be readily moved from place to place. This method of roof testing may be commended to the owners of all mines in which there are lofty galleries.

#### FALLS OF SIDE.

##### *No. 69.—Messrs. Hajeebhoy Laljee and Company's Mahakali coal mine.*

At this mine a new incline from the surface was being driven down to form a travelling road and second outlet. At the time of the accident the incline was 255 feet in length and had a maximum depth of 19 feet. The strata cut through consisted of soft sandstone and clay, and, in spite of the soft character of these rocks, and the fact that water was percolating from them, the sides of the incline were cut vertically without sloping or stepping. As might have been expected a fall of side took place. This buried eight persons all of whom were found to be dead by the time the fallen material had been lifted from over them. It was considered that the accident was due entirely to gross negligence. Criminal proceedings were instituted against the agent and the manager, and the latter was convicted and sentenced as detailed on page 22.

##### *No. 93.—The Bokaro-Ramgur, Limited's Dhori coal mine.*

A coal seam, 29 feet in thickness, dipping at a steep angle (1 in 2) was being mined by quarrying. The quarry was 370 feet in length, 100 feet in width and 40 feet deep. The overburden consists of sandstone, and this and the coal face in the quarry were sloped at an angle of 15 degrees from the vertical. Owing to the presence of a joint running parallel to the face of the quarry, and to recent heavy rain which had, no doubt, found its way along the joint, a mass of coal and overburden, 80 feet long by 39 feet in height and 5 feet in thickness, fell into the quarry and killed seven persons who were cutting floor coal at the bottom of the quarry.

The management considered that a slope of 15 degrees was sufficient, but experience has shown that this was not so, and this and other quarries at the same colliery are now being worked by a system in which the overburden is removed in steps with a considerably larger angle of slope,

*No. 73.—Mr. A. H. Gaston's Cherangcode mica mine.*

The scene of this accident is illustrated in Plan E. A vein of highly kaolinised pegmatite was being worked for mica under an alluvial capping from 20 to 25 feet in thickness. Two adits were driven from different levels on the side of a hill, and were subsequently joined. It was then decided to commence open working, and an opencast, 35 feet long by 15 feet wide and 25 to 31 feet deep, with vertical sides was made. While sixteen persons were at work in this opencast the higher side of it collapsed, burying ten persons of whom seven were killed and one was severely injured.

The manager, who had had many years' experience in mica mining, must have known perfectly well that the side of an excavation in soft material of the kind would not stand vertically for any length of time and should have been stepped or sloped at the angle of repose. The owner of the mine had actually instructed him in writing to do such stepping or sloping. He, however, failed to have it done. Criminal proceedings were instituted against him and he was convicted and punished as detailed on page 22.

**SUFFOCATION BY GASES.**

*No. 162.—The Pench Valley Coal Company, Limited's Chandametta coal mine.*

At this mine an area of workings not far from the shafts had been dispillared. The coal seam is 8 feet in thickness, but 2 or 3 feet of the upper portion is of inferior quality and is left behind in the goaf. There had been indications of spontaneous combustion for about a month, but apparently the gobstink was not pronounced, and it was not considered necessary to seal off the area.

On the day of the accident and towards the end of the shift some ten persons were engaged in loading and tramping tubs in workings adjacent to the dispillared area. It was noticed that there was something wrong with the atmosphere as lamps burnt dimly, and five of the workers came out to the pit bottom and sat there. They shouted to the others further in the workings, but got no reply. They then sent for the sirdar who came at once from another district and found that there was no air current as the fan on the surface had been stopped for repairs to a steam joint. He made two attempts to get into the workings, but by reason of the foul air was unable to do so. Some little time after the fan was re-started and he went in alone four times. On each occasion he succeeded in bringing out an unconscious person. The air was now clear, however, and with the help of others he brought out the last man. The unconscious persons were taken to the surface and all except two recovered.

The accident was due to the efflux of poisonous gases from the goafed area, and this efflux may have been due to (a) a fall within the area which displaced the gas, (b) an increase in the activity of the incipient fire in the area, or (c) the stoppage of the fan, or a combination of all three. After the accident the incipient fire increased greatly in activity and was sealed off.

In the official inquiry which followed this accident no breaches of the Mines Act were disclosed, but it should have been apparent to the manager that in the event of the stoppage of the fan there would be considerable risk of an efflux of gas from the goafed area. Definite instructions should have been given to withdraw all work-people whenever it was necessary to stop the fan. Under such circumstances also there should have been a competent person in immediate charge of the workmen in the district affected.

*No. 163.—The Bengal Coal Company, Limited's Sodepur coal mine.*

Nos. 7 and 8 pits at this colliery are 425 feet deep to the Dishergarh seam which at this point is 16 feet thick and inclined at an angle of 1 in 6. Ventilation is induced by an exhaust fan with a capacity of 120,000 cubic feet per minute placed at the top of No. 8 pit.

Large areas of the workings have been dispillared and sealed off. One of these areas lies to the dip of No. 7 pit. It was sealed off in 1919, and in 1921, as the pillars in which the stoppings were built showed signs of weakness, the stoppings were reinforced by dams, 15 feet thick. In 1922 the "weight" on

these pillars became more pronounced and a large area of pillars adjacent to the old goaf was subjected to a severe "crush." All the dams, however, except one remained intact, and the one which was defective was subsequently repaired. It was then decided to isolate the crushed area by another row of stoppings. At the time of the accident there were only five more stoppings to be built and work on these had been proceeding day and night, but for three days prior to the accident no work had been done in the mine on account of a festival.

On the day of the accident there was no work done in the mine, but the assistant and the head sirdar had together inspected all the workings, and after their last inspection when they returned to the surface at 5-30 P.M. they reported that everything was all right, and arrangements were made for a night shift of coolies to bail water out of certain galleries to the dip of No. 8 pit. About 10-30 P.M. an European assistant, named Dean, descended No. 8 pit with a sirdar, two pump attendants and seven bailing coolies. They sat down for a time at the top of the dip haulage road and thereafter went down the haulage road in pairs, Mr. Dean having gone first after telling them to follow him. Shortly after this a time-keeper went down No. 8 pit and at once smelt firestink. He went a little way down the dip haulage road and found two men lying unconscious. He returned to the surface and came back at once with Mr. A. B. Anderson, the assistant on the day shift. They brought out the two unconscious men and took them to the surface where they eventually recovered. Mr. Anderson again descended and went some further distance down the haulage road. He found the body of Moti, a pump minder, which he picked up and carried to the cage. His praiseworthy efforts to save life had by this time resulted in his becoming seriously affected by the foul air.

Shortly after mid-night a rescue party headed by the manager descended No. 7 pit and attempted to reach the scene of the accident by way of the intake airway. It was, however, driven back by gas. The mine agent and the Inspector of Mines, No. 2 Circle, having reached the mine, larger parties were got together and renewed attempts to rescue those underground were made from both pits, but these attempts also failed. It was then decided to reverse the direction of the air current, and the necessary alterations to the fan drift at No. 8 pit were completed shortly after mid-day on the following day. Within a couple of hours of the reversal of the air current a descent of No. 8 pit was possible, and the bodies of the nine persons missing were speedily recovered at intervals on No. 8 pit dip haulage road. That of Mr. Dean was about 1,100 feet from the top of the slope and was the furthest away of all. It was evident that at the time of his death he was gallantly assisting a crippled woman who had fallen in front of him.

After the completion of the rescue operations the shafts were closed down and sealed, and no further examination of the workings has since been possible. From the facts elicited at the official inquiry, however, it was considered that the gas which poisoned the deceased had been emitted from the old fire area to the dip of No. 7 pit by the sudden collapse of one or more of the stoppings. The management had been alive to this danger and, as stated above, they had been for some time building a second row of stoppings to shut off the dangerous area. An European assistant had been placed in charge of each shift, and instructions had been issued to them that in case of any apparent danger all persons were to be withdrawn from the mine at once.

The fact that Mr. Dean, the assistant, who had had considerable experience of mining, was overcome points to the probability that the gases encountered contained carbon monoxide, a subtle poison which acts insidiously and quickly renders persons unable to escape.

No breach of the rules under the Indian Mines Act was involved, but the occurrence of this accident has emphasised the importance of there being means to reverse the air current in any mine in which there are workings sealed off on account of fire, and a provision on these lines has been included in the draft regulations to be made under the new Mines Act. A second consideration is the fact that if efficient rescue apparatus and men trained in its use had been available lives might have been saved, and in any case the work of rescue could have been undertaken with greater safety and confidence. During the year a technical Committee appointed by the Indian Mining Association submitted to the Association a report with proposals for the establishment of a Central Rescue Station, and towards the

end of the year a Committee was appointed by the Council of the Mining and Geological Institute of India and has since submitted a report recommending the establishment of Central Rescue Stations in the coalfields, and putting forward a considered scheme which it is hoped the Indian Mining Association and the Indian Mining Federation may jointly take up.

#### IN SHAFTS (WHILST ASCENDING OR DESCENDING BY MACHINERY).

##### *No. 137.—The Burma Corporation, Limited's Bawdwin lead-silver mine.*

The internal shaft at the Bawdwin mine commences from a point some 100 feet below the surface, and at the time of the accident had been sunk to a depth of about 600 feet. It is rectangular in shape and completely lined with timber. The cages run on wooden guides fixed to the timbering. The previous history of the shaft is somewhat unfortunate, for, in 1920, owing to the jamming and subsequent fall of one of the cages, ten persons were killed.

An electric hoist is installed and whilst seven persons were being lowered in the cage the adjusting bolt on the clutch of the hoist broke, with the result that the cage fell away. The brake was applied but failed to stop the cage, which crashed on the landing beams. The injuries sustained proved fatal in the case of six of the seven occupants of the cage. Tests of the fractured bolt made at the Bengal Engineering College gave a maximum breaking stress of  $23\frac{1}{2}$  tons per square inch. After the accident a bolt made of Yorkshire iron was supplied and the tensile breaking stress of this material is, according to Molesworth, about 26 tons per square inch. Subsequently bolts of chrome nickel steel were brought into service. A test of one of these bolts made at the Alipur Test House, Calcutta, gave a tensile strength of 38.5 tons per square inch. Instructions have been given for these bolts to be changed every six months.

##### *No. 138.—The Central Kurkend Coal Company, Limited's Central Kurkend coal mine.*

This is an example of how easy it is for accidents to occur in Indian mines when discipline is relaxed. Four persons boarded a sinking bucket at a mid inset in a shaft. Instead of being raised in compliance with signals the bucket was lowered into water at the bottom of the shaft, and one of the occupants was drowned.

At the time of the accident the manager was on leave and the engineer was in charge. At the inquiry it came out that when the signal was given for the bucket to be raised neither the winding engineman nor the banksman were at their proper stations. The engineman heard the signals from a distance and going to the engine house started the engine without noticing that he had forgotten to reverse the engine. Criminal proceedings were instituted against him by the management but he absconded and the case fell through. Accidents of this class would be fewer if absences from a post of duty were treated with greater severity.

#### SUNDRIES UNDERGROUND.

##### *No. 213.—The Khas Jherria Colliery Company, Limited's Khas Jherria coal mine.*

Pillars of coal, 20 to 30 feet square, formed by galleries from 16 to 18 feet wide, were being extracted systematically in a seam, 24 feet thick, at a depth of some 60 feet from the surface. The overlying strata consist of soft shale which does not break down at regular intervals. Timber was being withdrawn from the goaf when the roof showed signs of breaking down, and the workmen, eight in number, at once retired to a narrow road, some 150 feet distant. An area, about 200 feet by 150 feet, collapsed, and the expelled air attained such a velocity as to knock down the men in the narrow road, thereby causing serious injuries. One of them afterwards died. This accident is similar to one which occurred at Rawanwara colliery in the Central Provinces earlier in the year. In both cases the mines were shallow and the overlying strata soft. It may be that under these conditions collapse of the roof is more sudden than in the case of harder rocks.

The latter would certainly be likely to leave more cavities into which expelled air could flow. These air blasts, however, are by no means confined to shallow mines. In 1919 at a neighbouring mine where the same seam was being worked at a depth of 150 feet an air blast of such violence took place that a winding cage was blown up a shaft, and its subsequent fall broke the rope, causing the death of a man who was riding in the cage at the time. At one time air blasts were not infrequent in the Giridih coalfield, where a thick seam underlying unusually hard and homogeneous sandstone rock is systematically worked at a considerable depth, and very large areas of coal can be removed before collapse takes place. At these mines the work-people have been instructed to retire a short distance and lie down in the galleries when a sudden and extensive fall of roof is expected. By taking this precaution they escape injury, as the blast passes over them harmlessly. At mines where air blasts are likely to occur the officials would do well to follow this example, and instruct their miners accordingly.

#### MISCELLANEOUS ON SURFACE.

*No. 31 (non-statistical list). Messrs. Villiers, Limited's Bagdiggi coal mine.*

At this colliery two coal seams, 25 feet and 7 feet thick, respectively, and separated by 8 feet of stone, had been worked and formed into pillars. These pillars were of insufficient size and they began to crumble, so that in November 1922 an anticipated subsidence of the surface caused by their collapse took place. This subsidence was adjacent to an inhabited village, and, as it was thought that the area of collapse might extend so as to involve inhabited buildings, steps were taken to obtain evacuation of houses in the danger zone. This was found to be a matter of great difficulty, for the inhabitants were unwilling to leave their dwellings. In spite of all efforts made by the mine-owners, the Mines Department and the District Magistrate, it was found to be impossible to ensure vacation of the buildings and the fencing of the dangerous area. On 1st September 1923, the mine manager reported that the pillars underlying the village were showing signs of imminent collapse. Renewed efforts were made to induce the inhabitants to leave, but they were only partially successful, for on 10th September when collapse of the surface took place some seven or eight persons were in the houses which collapsed, and one of them was killed. The loss of life might have been much greater.

It seems fitting that when an area is known to be in danger of collapse as the result of mining operations, some authority should have power to order the fencing of the area endangered and the vacation and perhaps demolition of any buildings involved. The matter is one which bristles with legal and other difficulties and it rests at present in a most unsatisfactory position.

### Section IV.—Prosecutions and additions to the Act.

#### PROSECUTIONS.

Judgment was given in the following prosecutions during the year. Unless otherwise stated "rule" means a rule under Notification No. 864-68-20, dated the 10th March 1904, being rules for the working of coal mines.

The owner and acting manager of J. P. Lalla's Tundu Khas coal mine were prosecuted under Rules 3 and 19 and Rule 3 of Government of Bihar and Orissa Notification No. 11761-M., dated the 23rd August 1918, for not keeping working places secure, for not fencing the entrance to an incline and for not providing gates at the entrances to two inclines. They were fined Rs. 600 and Rs. 50, respectively.

Pramode Kumar Sen Gupta was prosecuted under Section 22 (1) (d) of the Indian Mines Act for falsifying a date in a certificate in order to represent that he had the practical experience required to entitle him to sit for the examination for Colliery Managers' Second Class Certificates of Competency. He was fined Rs. 30.

Dharani Dhar Chowdhuri was prosecuted under Section 22 (1) (d) of the Indian Mines Act for submitting a false certificate in support of his application

to sit for the examination for Colliery Managers' Second Class Certificates of Competency. He was fined Rs. 30.

The agent and manager of Hajeebhoy Laljee and Company's Mahakali coal mine were prosecuted under Rule 3 for not keeping the sides of an incline cutting secure. The agent was acquitted and the manager was fined Rs. 300.

The owner and manager of W. C. Bhattacharji's Egarcoor coal mine were prosecuted under Rules 3 and 7 for not keeping working places secure and for not fencing disused workings. They were fined Rs. 1,000 and Rs. 20, respectively, but on appeal the amount of the fine inflicted on the owner was reduced to Rs. 250.

The manager of A. H. Gaston's Cherangcode mica mine was prosecuted under Section 304 (a), read with Section 32 of the Indian Penal Code, for neglect to slope the side of an excavation which caused a fall of ground whereby seven persons were killed. He was fined Rs. 500.

The owner of Sheopersan Tewari's Pathariachuck coal mine was prosecuted under Section 13 (1) of the Indian Mines Act for not appointing a qualified manager. He was fined Rs. 50.

The owner of S. N. Bose's Banderchua coal mine was prosecuted under Rule 12. He was fined Rs. 25.

The manager of the Tata Iron and Steel Company, Limited's Choitodih coal mine was prosecuted for violating the provisions of Rule 62 (4) of the Indian Electricity Rules. He was fined Rs. 15.

The owner and manager of B. P. Singh's Kalipahari coal mine were prosecuted under Rules 2 (b) and (g) and 22 and Rule 2 of Government of Bengal Notification No. 3970-Com., dated the 28th August 1918. They were fined Rs. 50 each.

The owner and managing agents of G. L. Mukherji's Pahargora coal mine were prosecuted under Rule 12. They were fined Rs. 40 each.

The owner and agent, former manager and manager of Rai Sahib H. Verma and M. Kanhaiyalal, Limited's Rawanwara coal mine were prosecuted as follows:—The owner and agent under Rules 2 and 3 of Government of India Notification No. 11793-103, dated the 30th December 1908, as amended, and Rules 1 (a), 3 and 4 (a), and the other two accused under the last three rules. They were fined Rs. 300 each. On appeal the Sessions Judge sent up the case against the first accused for enhancement of sentence. He was accordingly fined Rs. 500 under Section 22 (1) (e) and Rs. 200 under Section 22 (3) (e). The appeals of the other two accused were rejected.

Seventeen prosecutions were instituted for failure to submit annual returns within the prescribed date. In thirteen cases fines aggregating Rs. 655 were imposed; two cases were withdrawn; in one case the charges against two of the accused were withdrawn whilst proceedings against the third accused are in abeyance as he has absconded. Another case is pending.

Information was received of the following prosecutions instituted by colliery officials against their subordinates:—

Two miners employed at the Central Provinces Prospecting Syndicate, Limited's Balaghat manganese mine were prosecuted for violating General Rules 14 and 15 of Government of India Notification No. 6436-152, dated the 2nd September 1911. They were fined Rs. 15 each.

The manager of the Samla Govindpur Collieries, Limited's Baidyanathpur coal mine prosecuted a coal-cutter under Special Rules 15 and 21 for working in a place other than that in which he was ordered to work and for cutting roof coal without special authority. His negligence caused a fatal accident. The accused absconded and could not be traced. The case was dismissed owing to the absence of the complainant.

The manager of the Bengal Iron Company, Limited's Ramnagore coal mine prosecuted an overman under Special Rule 47 for leaving the mine without being relieved. He was fined Rs. 30.

The manager of the Burrakur Coal Company, Limited's Joba coal mine prosecuted a sirdar under Special Rule 46 for not exercising proper supervision over

persons working under him. His negligence led to the occurrence of a fatal accident. The accused could not be traced and the case was struck off.

The manager of the Burrakur Coal Company, Limited's Charanpur coal mine prosecuted a sirdar under Special Rule 4 for absenting himself from duty without having previously obtained permission. The case was withdrawn.

The manager of the Central Kurkend Coal Company, Limited's Central Kurkend coal mine prosecuted a winding engineman under Special Rules 61 and 96 for starting his engine without receiving the proper signal and thereby causing a fatal accident. He absconded and the case fell through as he could not be traced.

The manager of the Bansdeopur Coal Company, Limited's Bansdeopur coal mine prosecuted an engine driver under Special Rules 3, 5 and 6 for disobeying orders and lowering tubs in such a manner as to endanger the lives of six other employes. He was fined Rs. 100. The same official also prosecuted three engine drivers, under Special Rule 4, for absenting themselves without permission. They were fined Rs. 10 each.

The manager of the Jharia Coal Association's Harinachack coal mine prosecuted a pumpman and a boiler fireman under Special Rule 4 for absenting themselves without permission. They were fined Rs. 10 each.

Two haulage attendants at the Great Indian Peninsula Railway Company's Mohpani coal mine were prosecuted under Section 304, Indian Penal Code, for committing a rash and negligent act and thereby causing a fatal accident. They were sentenced to four months' rigorous imprisonment each.

#### ADDITIONS TO THE ACT.

During the year Special Rules, under Section 21 of the Act, were established at 33 coal mines and 12 manganese mines. Special Rules have now been established at 698 coal mines and 52 manganese mines.

The rules for the examination and certification of underground sirdars which were published with Government of India, Department of Industries and Labour, Notification No. M.-498, dated the 14th April 1924, are reproduced in Appendix IV, Statement No. 8.

### Section V.—General Remarks.

#### HEALTH AND SANITATION.

The Asansol Mines Board of Health held twelve ordinary meetings and seven special meetings during the year. Dr. Tomb, the Chief Sanitary Officer of the Board, reported that there were 345 cases of cholera with 183 deaths and 54 cases of small-pox with 5 deaths during the year, as compared with 351 cases of cholera with 169 deaths and 52 cases of small-pox with no deaths during the previous year. No other disease was epidemic during the year and the general health of the Settlement was extremely good, the death rate being only 17·97 per thousand, and the infantile death rate 153·5 per thousand. The Board's anti-malarial staff carried out the annual mosquito and malarial survey of the Settlement, and, by the cleansing and draining of infested tanks, malaria wherever it appeared is said to have been at once suppressed.

The Jharia Mines Board of Health held thirteen ordinary meetings and seven special meetings during the year. Dr. G. W. Thompson was Medical Officer of Health, and Dr. A. G. Wright was Assistant Medical Officer of Health, throughout the year. There were 553 cases of cholera with 177 deaths and 737 cases of small-pox with 46 deaths, as compared with 279 cases of cholera with 79 deaths and 414 cases of small-pox with 10 deaths in the previous year. The general health of the mining community was good. The death rate was 17·3 per thousand and the birth rate 25·4 per thousand. The problem of securing efficient qualified medical attendance has again occupied the attention of the Board and in the Jharia coalfield unqualified practitioners have been eliminated. The most important work done by the Board during the year lay in the measures taken to improve the housing of colliery labour, and signs are not wanting that the miner himself is growing to appreciate good accommodation and beginning to demand it.



Statistics of rainfall have been recorded as follows :—

	1923.	1922.
<i>Jharia Coalfield—</i>		
Jealgora . . . . .	48.76	67.90
Topchanchi reservoir . . . . .	65.90	66.09
Dhanbad . . . . .	45.58	84.28
<i>Raniganj Coalfield—</i>		
Kulti . . . . .	61.28	84.01
Asansol . . . . .	56.10	84.07
<i>Giridih Coalfield—</i>		
Giridih . . . . .	66.55	64.77

#### MINING EDUCATION.

The Principal of the Bengal Engineering College has reported that in the examination for the Diploma in the principles of mining held at the end of the college course in March 1923, of the fourteen students who appeared at the examination all were granted Diplomas. In the Junior course, 20 were enrolled at the beginning of the session, eighteen sat for examination, and six qualified for promotion to the Senior course. Nineteen students entered the preliminary or preparatory class on the mining side, and of these ten were promoted.

The annual mining camp was pitched in November-December 1923 at Sunkerpore in the Raniganj coalfield. The usual courses of practical work were undertaken and visits of inspection were paid to various plants and appliances of technical interest in the vicinity. The total number of students in the camp was 40, of whom 15 were special survey students.

The Mining Education Advisory Board held five meetings during the year. The three-years course of instruction was introduced at the Raniganj and Sitarampur centres in the Raniganj coalfield. Mr. L. Millar was appointed Lecturer and Babu Sachidananda Mukherji, Assistant Lecturer. The same course of instruction was in full swing at the Jharia and Sijua centres in the Jharia coalfield, the numbers enrolled being 108 for the first year class, 124 for the second year class and 54 for the third and final year class. The teaching staff was Mr. Griffith Jones, B.Sc., assisted by Babus N. N. Sen and B. K. Palit. Professor E. H. Robertson and Mr. D. Penman were the examiners. Courses of ten lectures in Hindi to overmen and sirdars were delivered at five centres in the Jharia coalfield and at one centre in the Mugma section of the Raniganj coalfield. A total of 226 students attended the lectures, a special feature of which is the giving of practical demonstrations of timbering, methods of working and safety precautions in the mine. The lecturers were Babus S. N. Bhattacharyya, Tarapada Bhattacharyya and K. M. Chatterji. Similar lectures in Bengali were delivered by Babu Jadu Gopal Banerji at three centres in the Raniganj coalfield, and the Bengal Government has been asked for sanction to extend and improve the course as has been done in Bihar and Orissa.

The construction of the four new lecture halls has been completed and all members of the teaching staff except the Mining Lecturer, Bengal, have been provided with residences.

Largely as the result of efforts made by Rai Sahib Mathura Prasad a course of instruction in mining and allied subjects was introduced during the year by the Government of the Central Provinces in the Pench Valley Coalfield. The

classes were held in a building provided by Messrs. Shaw Wallace & Company ; Mr. G. O. Burgoyne gave the lectures on mining and Mr. S. G. Nafde, B.Sc., L.T., those on elementary science. The number of students enrolled was 28 and of these 14 completed the course.

#### BOARD OF EXAMINERS FOR COAL MINE MANAGERS' CERTIFICATES.

Five meetings of the Board of Examiners were held during the year. The non-official members were Messrs. J. B. Wardlaw and J. Mackie. Twelve first class certificates and one second class certificate of competency were granted in lieu of British certificates.

At the examinations for colliery managers' certificates of competency held at Dhanbad on the 19th, 20th and 21st, 26th, 27th and 28th February 1923, one hundred and seven candidates sat for first class and two hundred and ninety-seven for second class certificates. Certificates of competency were granted to twelve first class and thirty-five second class candidates.

The percentage of passes is very low as the majority of candidates come ill prepared, and their hardihood in presenting themselves for examination is astonishing. Under the new draft regulations the fees have been increased, and it may be hoped that this will discourage the attendance of many who have not the remotest chance of success, and relieve an organization which has been over-worked almost to the point of a breakdown.

The examiners for the first class examination were Messrs. W. Weir and R. Heron and for the second class examination Messrs. T. C. Murray and C. E. Ashcroft. Messrs. D. Penman and J. H. Lang, Inspectors of Mines in India, acted as official examiners and secretary and assistant secretary, respectively. The question papers are reproduced in Appendix IV, Statement No. 7.

#### MINING BOARDS IN BENGAL, BIHAR AND ORISSA AND THE CENTRAL PROVINCES.

The Bengal Mining Board held four meetings during the year. The subjects considered by the Board were :—(a) draft rules under Section 11 of the Bengal Mining Settlements Act ; (b) compulsory sand-stowing in coal mines ; (c) employment of women in mines ; (d) proposed introduction of a system of shifts in mines ; and (e) exemptions of mines from the operation of the Indian Mines Act, 1923. The non-official members of the Board were Messrs. W. Graham and J. B. Wardlaw.

The Mining Board, Bihar and Orissa, held only one meeting during the year. The subjects discussed at the meeting and by correspondence were (a) employment of women in mines ; (b) proposals for a system of shifts in mines ; (c) certification of sirdars in coal mines ; and (d) exemptions of mines from the operation of the Indian Mines Act, 1923. The non-official members of the Board were Messrs. R. G. M. Bathgate and J. Mackie.

The Central Provinces Mining Board did not meet during the year.

#### MINING AND GEOLOGICAL INSTITUTE OF INDIA.

The total membership of the Mining and Geological Institute of India at the end of the year, including subscribers, was 346. At the annual meeting and at four ordinary meetings papers were read and discussed. The subjects of the employment of women in mines and the introduction of a system of shifts in coal mines were also fully discussed, and the considered views of the Council of the Institute were submitted to Government. At the invitation of Messrs. Bird & Company a visit was paid to the Kumardhubi Engineering Works and the Kumardhubi Fireclay and Silica Works, near Barakar, E. I. Railway. A committee consisting of Messrs. C. E. Ashcroft, G. Entwisle, M. McCormick, D. Penman, R. R. Simpson (Chairman) and H. M. Tarlton was appointed to report on the proposals to establish "rescue stations" in the Indian coalfields.

Three parts of the Transactions were published. The Government prize for the best paper accepted for publication during the year was awarded to Mr. Lancaster D. Burling for his paper entitled "The Origin of Petroleum." The writer of the paper was also awarded the Institute's gold medal. The silver medal was not awarded ; the bronze medal was awarded to Mr. F. B. Kerridge for his paper on "Electrical Developments in the Jharia Coalfield."

## THE ASSOCIATION OF COLLIERY MANAGERS IN INDIA.

During the year the subjects dealt with by the Association of Colliery Managers in India were (a) penalty charges on overloaded wagons; (b) the Jharia Water Supply Act; (c) the housing standards of the Jharia Mines Board of Health; (d) draft regulations under the new Mines Act, 1923; and (e) Permits to manage small coal mines.

### AMBULANCE WORK IN THE COALFIELDS.

Towards the end of 1922 local centres of the St. John Ambulance Association were formed in the Jharia and Raniganj coalfields, and committees were appointed to arrange for the conduct of classes in First-Aid to the injured. During the year classes were held at six centres, and eighty-three St. John Ambulance First-Aid certificates were gained.

### LAND ACQUISITION (MINES) ACT, 1885.

The number of original cases disposed of altogether at the end of 1923 stood at 484, twenty of which were cases disposed of during the year. There were ten applications for modifications of restrictions and twenty-three complaints of violations of restrictions, all of which were dealt with. The Act applies to Bengal and Bihar and Orissa only. In other provinces where Government owns the minerals Local Governments were advised as to the restrictions necessary in cases where mine-owners have sought permission to work minerals beneath railways, villages, etc.

### APPLICATIONS FOR EMPLOYMENT.

In the last two Annual Reports it was stated that for the convenience of mine-owners and managers a register of the names of applicants for employment holding first or second class colliery managers' certificates had been opened in the Chief Inspector's office and could be inspected on request. Many applicants, however, appear to imagine that the statement implies an obligation on the Chief Inspector to find them employment as managers. They would be well advised to accept employment in a subordinate capacity. In Great Britain the number of holders of managers' certificates is many times greater than the number of coal mines, and the majority of certificate holders never attain to the dignity of mine management. Many of them are employed as under-managers and underground officials, whilst not a few are actually cutting coal at the face.

### APPOINTMENT OF THE COAL DUST COMMITTEE.

On 24th July 1923, and as the result of a recommendation made in the report of the inquiry into the circumstances of the coal dust explosion at Parbelia Colliery, the Government of India was pleased to appoint a Committee to investigate the dangers arising from coal dust in Indian mines. The *personnel* of the Committee is as follows :—

#### *Chairman.*

Mr. R. R. Simpson . . . . Chief Inspector of Mines in India.

#### *Members.*

Mr. J. B. Wardlaw . . . .	} Nominated by the Indian Mining Association.
Capt. J. G. Foster, succeeded by Mr. P. Bates.	
Mr. H. C. Read . . . .	
Mr. H. K. Nag . . . .	} Nominated by the Indian Mining Federation.
Mr. J. Thomas . . . .	
	} Nominated by the Mining and Geological Institute of India.
Mr. G. Naysmith . . . .	
	} Nominated by the Colliery Managers' Association in India.
Mr. J. H. Lang . . . .	
	} Inspector of Mines in India, No. 2 Circle, and
Mr. D. Peuman . . . .	
	} Inspector of Mines in India, No. 1 Circle (also Secretary).

The terms of reference are :—

“ To enquire into the danger of explosion of coal dust in Indian coal mines ; to make experiments on different kinds of coal-dust with a view to determine their liability to explode or otherwise ; and to report what means, if any, are necessary or desirable to provide against the risk of coal-dust explosions in Indian coal mines.”

A sum of seven thousand five hundred and sixty rupees was provided by the Government of India for the expenses of the inquiry during 1923-24. By the close of the year an experimental gallery had been erected at Dhanbad, and large scale experiments with coal dust of different kinds had been commenced. By the same time the chemical investigation of the problem at the Government of India laboratories in the Alipur Test House, Calcutta, had been well advanced. The good progress obtained was largely due to the marked capacity and untiring energy of Mr. D. Penman, Officiating Chief Inspector of Mines, who was chairman of the Committee until almost the end of the year.

#### OFFICIAL DUTIES, 1923.

Mr. R. R. Simpson was Chief Inspector of Mines. He was on leave from the 13th April to 17th November.

Mr. D. Penman was Offg. Inspector of Mines, No. 1 Circle. He officiated as Chief Inspector of Mines from 13th April to 17th November.

Mr. J. H. Lang was Inspector of Mines, No. 2 Circle, throughout the year.

Mr. F. B. Kerridge was Electric Inspector of Mines throughout the year.

Mr. G. S. Cameron was Junior Inspector of Mines throughout the year.

Mr. W. Kirby was Junior Inspector of Mines and officiated as Inspector of Mines, No. 1 Circle, from 13th April to 17th November.

Mr. H. R. Tallis was Junior Inspector of Mines until 10th November. He was then granted leave until 12th December, when his services terminated.

Messrs. N. G. Chatterjee and N. Barraclough were appointed Junior Inspectors of Mines on 14th July and 31st December, respectively.

Of the 1,543 mines at work it was not possible to inspect more than 903. Practically all important mines were inspected and many of them several times. 1,680 separate inspections were made. Inquiries were held in the case of nearly all the fatal accidents and certain of the serious accidents. All complaints of breaches of rules were investigated. Several inspections were made on the invitation of mine-owners, superintendents or managers anxious for consultation and advice on safety matters.

I have the honour to be,

SIR,

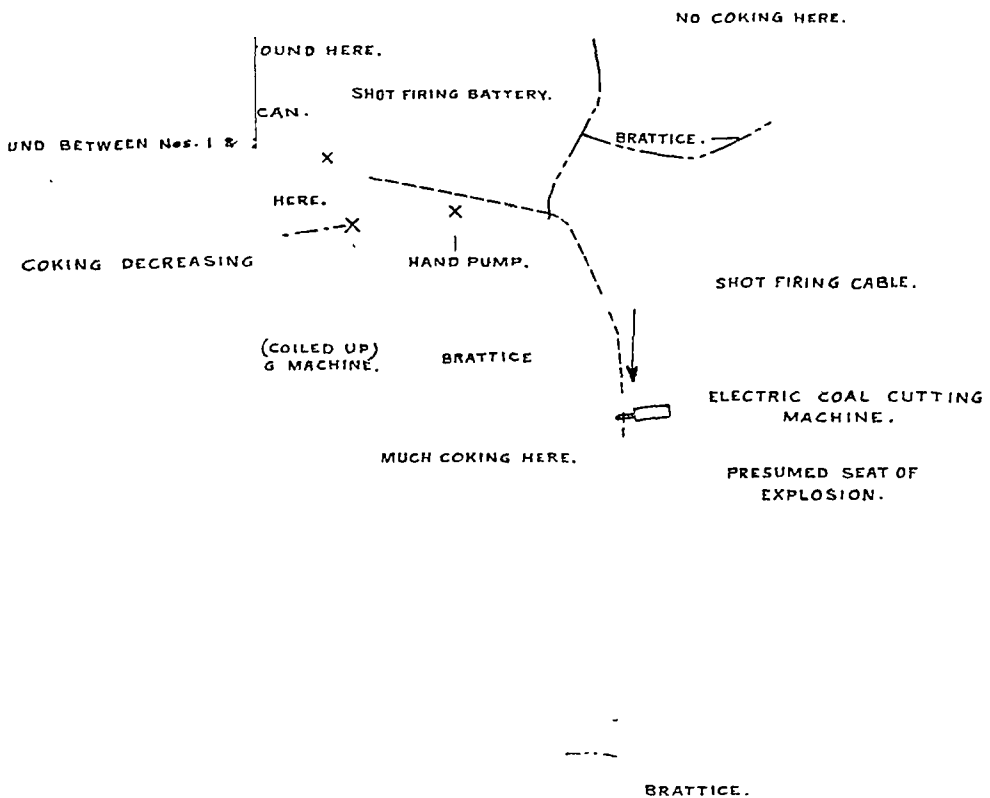
Your most obedient Servant,

R. R. SIMPSON,

*Chief Inspector of Mines in India.*



PORT ON  
OF COAL  
RBELIA





## STATISTICS OF MINES AND MINERALS.

Table No. 1.

Number of mines regulated by the Indian Mines Act, 1901, number of workers and output of minerals, during the year 1923.

AVERAGE NUMBER OF PERSONS EMPLOYED DAILY IN AND ABOUT THE MINES.																				
PROVINCE.	District and mineral field.	Number of mines under scope of the Act.	NUMBER OF MINES.		NUMBER OF MINES INSPECTED DURING THE YEAR.		TOTAL OUTPUT.	BELOW GROUND.						ABOVE GROUND.				Grand total below and above ground.		
			Not worked by mechanical power.		Number of mines inspected.	MINERS.				OTHERS.		Total below ground.	Adult males.	Adult females.	Children.	Total above ground.				
			Worked by mechanical power.			Adult males.		Adult females.	Children.	Total.	Adult males.						Adult females.		Children.	Total.
Assam	Lakhimpur	6	5	1	6	10	Tons. 270,343	1,888	169	..	2,057	..	..	..	2,057	884	275	86	1,215	3,202
	Naga Hills	1	..	1	2	55,000	140	..	..	..	110	210	..	240	380	203	7	210	509	
	Sibsagar	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
	TOTAL	7	5	2	12	325,010	2,028	169	..	..	2,167	240	..	..	219	2,440	1,087	282	86	1,455
Baluchistan	Kalat	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Loralai	1	..	1	..	113	35	..	..	..	35	..	..	..	..	55	..	..	55	90
	Quetta-Pishin	8	..	8	..	4,070	77	..	..	..	77	..	..	..	77	30	..	..	30	116
	Sibi-Khest	5	1	4	..	20,501	220	..	..	..	220	210	..	240	475	301	..	7	308	813
Bengal	TOTAL	14	1	13	..	31,020	311	..	..	..	311	210	..	210	587	155	..	7	162	1,049
	Bankura, Raniganj	1	..	4	2	8,510	51	57	..	..	111	10	..	..	10	37	34	..	71	102
	Birbhum	6	3	3	..	18,881	101	16	..	..	117	18	3	1	22	89	45	1	135	271
	Burdwan	200	210	11	100	1,501,187	11,005	0,816	20	18,837	5,807	3,010	21	8,970	27,807	10,371	5,272	335	16,078	43,785
Bengal	TOTAL	270	210	51	102	1,621,578	12,150	0,880	20	19,065	5,025	3,052	25	0,002	28,007	10,107	5,351	336	10,181	41,251



# APPENDIX I—contd.

## STATISTICS OF MINES AND MINERALS—contd.

Table No. 1—contd.

Number of mines regulated by the Indian Mines Act, 1901, number of workers and output of minerals, during the year 1923—contd.

PROVINCE.	District and mineral field.	Number of mines under the scope of the Act.	NUMBER OF MINES.		NUMBER OF MINES INSPECTED DURING THE YEAR.	TOTAL OUTPUT.	AVERAGE NUMBER OF PERSONS EMPLOYED DAILY IN AND ABOUT THE MINES.														
			NUMBER OF MINES.				MINERS.				OTHERS.				BELOW GROUND.		ABOVE GROUND.				
			Worked by mechanical power.	Not worked by mechanical power.			Adult males.	Adult females.	Children.	Total.	Adult males.	Adult females.	Children.	Total.	Total below ground.	Adult males.	Adult females.	Children.	Total above and above ground.		
																				Number of mines inspected.	Number of inspections.
A.—COAL—contd.																					
Bihar and Orissa.	Hazaribagh { Dokaro Girdih Jharia Rangarh	5	4	1	4	5	1,000,360	2,498	2,573	22	5,093	716	628	92	1,096	2,958	1,573	311	1,875	11,374	
		12	4	8	11	16	680,782	3,565	1,253	10	4,837	374	82	..	460	1,504	777	12	2,203	7,586	
		13	5	8	11	13	173,080	438	310	1	749	124	23	28	185	686	360	40	1,104	2,038	
		3	..	3	..	..	4,197	28	42	..	70	1	..	..	1	82	15	36	133	204	
		303	205	188	327	741	10,172,935	21,314	17,532	134	38,080	8,708	3,506	68	12,282	23,265	12,108	1,838	37,211	88,473	
	Manbhum { Raniganj Palamanu, Daltonganj Sambalpur, Hingir-Rampur Sonthal Paraganas, Raniganj	114	22	92	80	139	810,545	2,815	1,208	..	4,053	753	454	10	1,217	2,471	1,360	703	3,031	9,201	
		1	1	..	1	1	11,815	65	34	6	105	25	10	4	39	144	54	14	120	264	
		2	1	1	2	2	50,790	51	7	..	61	131	83	..	217	278	142	3	170	454	
		7	4	3	3	3	82,166	368	175	..	543	181	85	..	200	807	256	..	353	1,160	
		7	6	1	2	2	80,301	337	178	..	485	52	73	..	125	610	297	212	10	519	1,129
Burma.	Mergul Southern Shan States	557	252	305	441	922	13,171,983	31,480	23,312	182	54,971	11,068	4,954	172	10,104	31,715	10,591	2,400	50,718	121,886	
		1	..	1	..	..	103	11	..	..	14	..	..	..	..	11	31	..	31	48	
		2	1	1	..	..	1,108	33	..	..	33	..	..	..	..	33	76	..	76	100	
Central Provinces.	Betul Chanda, Ballarpur Chhindwara, Panch Valley Narsinghpur, Mohpan Yectmal	3	1	2	..	..	1,271	17	..	..	17	..	..	..	..	47	110	..	110	157	
		9	..	9	2	3	2,018	35	29	..	61	22	12	4	38	102	64	30	7	101	203
		9	6	3	6	12	112,302	579	31	7	620	362	117	6	505	1,125	728	103	36	957	2,082
		47	8	39	34	50	346,094	1,475	561	179	2,218	542	634	74	1,260	3,160	1,320	722	268	2,316	5,781
		1	1	..	1	2	87,387	312	..	..	312	459	338	..	707	1,100	499	91	..	590	1,690
		2	1	1	..	..	168	2	2	..	4	..	..	..	..	4	26	10	5	41	45
TOTAL		98	16	62	43	60	518,050	2,403	929	186	3,218	1,375	1,131	84	2,590	2,643	1,040	310	1,005	9,813	

Punjab	Jhelum . . . . .	21	..	21	..	..	43,253	443	..	3	440	205	..	7	302	748	408	..	11	500	1,257
	Manwall . . . . .	1	..	1	..	..	11,065	50	..	..	50	4	..	..	4	60	77	2	..	70	139
	Shahpur . . . . .	1	..	1	..	..	8,283	43	..	..	43	20	..	..	20	63	85	..	..	85	148
	TOTAL	23	..	23	..	..	63,501	542	..	3	515	310	..	7	326	871	..	2	11	673	1,544
Bihar and Orissa	GRAND TOTAL (CONT.) FOR 1923	912	494	448	724	1,402	18,763,907	48,001	30,000	397	80,387	10,182	9,137	288	28,007	109,001	47,107	23,275	3,105	73,007	182,001
	" " OF PRECEDING YEAR	953	486	407	700	1,044	18,10,988	48,380	20,314	402	78,180	18,571	10,139	295	20,308	107,404	48,505	25,036	3,200	70,801	181,355
	DIFFERENCE	-41	+8	-10	-42	-182	+591,970	+611	+1,085	-95	+2,201	+608	-1,302	-7	-701	+1,500	-1,393	-1,701	-95	-3,254	-1,754
Madras	B.—MICA.																				
	Cwt.																				
	Gaya . . . . .	14	..	14	6	12	2,010	336	100	424	547	30	11	..	41	588	98	50	20	177	705
	Hazaribagh . . . . .	275	32	243	103	127	10,289	2,405	706	235	3,406	425	002	517	1,604	5,010	1,122	506	583	2,301	7,311
Rajputana	Monghyr . . . . .	1	..	1	..	..	15	18	20	..	38	..	..	..	..	38	5	..	6	11	49
	Sambalpur . . . . .	2	..	2	..	..	..	10	..	..	10	9	42	9	00	70	8	..	..	8	84
	TOTAL	292	32	260	100	130	22,253	2,835	8,955	277	4,007	464	715	526	1,705	5,712	1,233	046	8618	2,467	8,209
Rajputana	Nellore . . . . .	41	13	28	..	..	8,671	559	140	17	725	200	103	16	415	1,140	305	322	201	828	1,968
	Nights . . . . .	3	..	3	1	1	143	34	..	..	34	7	11	..	18	52	22	13	13	48	100
	TOTAL	44	13	31	1	1	8,814	593	140	17	759	213	204	16	433	1,192	327	335	214	870	2,068
Rajputana	Almer-Merwara . . . . .	10	..	10	..	..	538	142	30	12	184	29	26	..	55	230	52	11	..	03	302
	GRAND TOTAL (Mica) FOR 1923	355	45	310	110	140	31,605	3,570	1,074	300	4,950	700	945	542	2,103	7,143	1,012	992	832	3,436	10,579
	" " OF PRECEDING YEAR	441	49	392	30	30	30,089	3,558	1,275	401	5,004	507	924	350	1,547	0,011	2,146	1,219	1,000	4,461	11,105
	DIFFERENCE	-86	-4	-82	+80	+110	+1,516	+212	-201	-155	-144	+130	+321	+150	+640	+502	-534	-227	-207	-1,028	-550

# APPENDIX I—contd.

## STATISTICS OF MINES AND MINERALS—contd.

Table No. 1—contd.

Number of mines regulated by the Indian Mines Act, 1901, number of workers and output of minerals, during the year 1923—contd.

AVERAGE NUMBER OF PERSONS EMPLOYED DAILY IN AND ABOUT THE MINES.																								
PROVINCE.	District and mineral field.	Number of mines under scope of the Act.	NUMBER OF MINES.		NUMBER OF MINES INSPECTED DURING THE YEAR.		TOTAL OUTPUT.	MINERS.						BELOW GROUND.						ABOVE GROUND.				Grand total below and above ground.
			Worked by mechanical power.	Not worked by mechanical power.	Number of mines inspected.	Number of inspections.		MINERS.				OTHERS.				Total below ground.	Adult males.	Adult females.	Children.	Total above ground.				
								Adult males.	Adult females.	Children.	Total.	Adult males.	Adult females.	Children.	Total.									
C.—MANGANESE ORE.																								
							Tons.																	
Bombay	Panch Mahals	2	..	2	..	..	35,354		531	380	..	920	66	..	..	66	080	235	81	102	418	1,104		
Central Provinces	Balaghat	32	1	31	13	15	108,162		1,844	2,138	88	4,070	81	..	..	81	4,151	750	580	84	1,423	5,574		
	Bhandara	6	..	6	2	3	69,164		339	550	64	953	3	..	..	3	956	177	139	5	321	1,277		
	Chhindwara	3	1	2	1	1	30,066		287	327	..	614	..	..	..	..	614	158	41	20	228	842		
	Jubbulpore	1	..	1	..	..	..		..	..	..	..	..	..	..	..	..	22	7	..	29	20		
	Nagpur	25	2	23	11	11	188,070		1,024	1,850	25	3,409	109	35	..	144	3,643	671	431	39	1,141	4,784		
	TOTAL	67	4	63	27	30	486,071		4,004	4,865	177	9,136	193	35	..	228	9,364	1,778	1,207	157	3,142	12,500		
Madras	Bellary	1	..	1	..	..	2,420		238	165	15	418	..	..	..	..	418	48	40	..	97	515		
	Vizagapatam	9	..	9	..	..	22,524		570	304	91	965	9	..	..	9	974	179	44	7	230	1,204		
	TOTAL	10	..	10	..	..	24,953		808	469	106	1,383	0	..	..	9	1,392	227	93	7	327	1,719		
	GRAND TOTAL (MANGANESE ORE) FOR 1923	79	4	75	27	30	546,378		5,433	5,723	283	11,430	208	35	..	303	11,712	2,240	1,381	206	3,897	15,629		
	" " OF PRECEDING YEAR	54	4	50	20	28	392,322		4,034	4,424	292	8,060	104	4	..	198	8,558	1,729	1,129	3,309	3,107	12,025		
	DIFFERENCE	+25	..	+25	+1	+2	+154,050		+1,309	+1,299	+81	+2,779	+74	+31	..	+105	+2,884	+511	+252	-13	+720	+3,604		

D.—LIMESTONE.																										
																										Tons.
Burma . . . . .	Northern Shan States . . . . .	2	..	2	1	1	12,067	120	..	..	120	133	..	30	4	39	74	62	50	7	119	193	35	..	35	288
	{ Central Provinces . . . . .	Blaspur . . . . .	1	..	1	..	7,570	35	..	..	35	5	5	2,332	1	2,823	5,389	542	425	71	1,038	6,427	62	50	7	119
		Jubbulpore, Katni . . . . .	22	2	20	22	24	215,924	1,575	966	25	2,560	490	2,332	1	2,823	5,389	542	425	71	1,038	6,427	542	425	71	1,038
		TOTAL . . . . .	23	2	21	22	24	223,491	1,010	966	25	2,601	495	2,362	5	2,862	5,463	604	475	78	1,157	6,650	604	475	78	1,157
	GRAND TOTAL (LIMESTONE) FOR 1923.	25	2	23	23	25	236,161	1,730	966	25	2,721	628	2,362	5	2,995	5,716	639	475	78	1,192	6,908	639	475	78	1,192	
{	" " OF PRECEDING YEAR . . . . .	27	2	25	20	20	110,507	1,155	936	50	2,141	96	946	53	1,095	3,236	467	386	97	950	4,186	467	386	97	950	
	DIFFERENCE . . . . .	-2	..	-2	+3	+5	+95,654	+575	+30	-25	+580	+532	+1,416	-48	4,900	+2,480	+172	+80	-19	+242	+2,722	+172	+80	-19	+242	
Punjab . . . . .	{	Jhelum . . . . .	1	1	1	1	91,184	186	125	20	331	155	..	..	..	155	486	..	..	..	..	486	..	..	..	486
		Mianwali . . . . .	1	..	1	..	..	3,999	37	..	4	41	..	..	..	..	41	..	..	..	..	..	..	..	41	
		Shahpur . . . . .	1	..	1	..	..	18,517	42	28	3	73	..	..	..	..	73	..	..	..	..	..	..	..	73	
	GRAND TOTAL (SALT) FOR 1923	3	1	2	1	1	113,700	265	153	27	445	155	..	..	..	155	600	..	..	..	..	..	..	..	600	
	" " OF PRECEDING YEAR . . . . .	3	1	2	2	7	187,157	643	35	3	631	103	478	55	636	1,317	45	..	..	..	..	..	..	..	1,362	
{	DIFFERENCE . . . . .	..	..	..	-1	-6	-73,457	-378	+118	+24	-236	+52	-478	-55	-481	-717	-45	..	..	-45	..	..	..	-45	-762	
Burma . . . . .	{	Katha . . . . .	2	2	..	5	92,592	638	..	..	638	153	..	..	..	153	791	494	..	..	494	1,285	..	..	..	1,285
		TOTAL . . . . .	2	2	..	5	5	187,010	638	..	..	638	153	..	..	..	153	791	494	..	..	494	1,285	..	..	1,285
		TOTAL OF PRECEDING YEAR . . . . .	5	2	3	..	..	231,160	624	..	..	624	135	..	..	..	135	759	495	..	..	495	1,254	..	..	1,254
	DIFFERENCE . . . . .	-3	..	-3	+5	+5	-44,150	+14	..	..	+14	+18	..	..	..	+18	+32	-1	..	..	-1	..	..	-1	+31	

## E.—SALT.

## F.—GEMS.

## (a) Rubies.

## (b) Sapphires.

## (c) Spinels.

34

I.—IRON ORE.																		
Bihar and Orissa	Singbhum.	3	..	3	2	2	215,148	014	283	19	910	..	..	839	609	54	1,502	2,418
Burma	Mandalay	1	..	1	..	..	329	..	..	..	..	..	..	145	5	..	150	150
	Northern Shan States	4	..	4	1	1	52,911	700	..	..	700	..	..	282	78	..	300	1,000
	TOTAL	5	..	5	1	1	53,240	700	..	..	700	..	..	427	83	..	510	1,210
Central Provinces	Chanda	1	..	1	..	..	23,345	01	18	..	70	..	..	87	04	22	173	252
	GRAND TOTAL (IRON ORE) FOR 1923	9	..	9	3	3	292,033	1,375	301	19	1,005	..	..	1,353	750	70	2,185	3,880
	" OF PRECEDING YEAR	10	1	9	3	7	240,383	012	495	30	1,137	228	17	570	102	50	788	2,170
	DIFFERENCE	-1	-1	..	..	-4	+51,050	+763	-104	-11	+558	-228	-17	+783	+594	+20	+1,307	+1,710
J.—WOLFRAM ORE.																		
							Tons.											
Burma	Mergul	..	..	..	..	..	871½	..	..	..	..	..	..	..	..	..	..	..
	Tavoy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Thahton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	TOTAL	..	..	..	..	..	872	..	..	..	..	..	..	..	..	..	..	..
	TOTAL OF PRECEDING YEAR	3	..	3	..	..	942	107	..	..	107	..	..	32	..	..	32	190
	DIFFERENCE	-3	..	-3	..	..	-70	-107	..	..	-107	..	..	-32	..	..	-32	-100
K.—MAGNESITE.																		
							Tons.											
Madras	Salem	2	..	2	..	..	19,330	415	208	072	1,385	..	..	102	15	00	177	1,502
	TOTAL OF PRECEDING YEAR	2	..	2	1	1	18,417	260	248	408	925	..	..	112	..	40	152	1,077
	DIFFERENCE	..	..	..	-1	-1	+910	+140	+50	+204	+400	..	..	-10	+15	+20	+25	+485

# APPENDIX I—contd.

## STATISTICS OF MINES AND MINERALS—contd.

Table No. 1—contd.

Number of mines regulated by the Indian Mines Act, 1901, number of workers and output of minerals, during the year 1923—contd.

AVERAGE NUMBER OF PERSONS EMPLOYED DAILY IN AND ABOUT THE MINES.																	
PROVINCE.	District and mineral field.	Number of mines under scope of the Act.	NUMBER OF MINES.		NUMBER OF MINES INSPECTED DURING THE YEAR.	TOTAL OUTPUT.	BELOW GROUND.						ABOVE GROUND.				Grand total below and above ground.
			Worked by mechanical power.	Not worked by mechanical power.			MINERS.				OTHERS.						
							Adult males.	Adult females.	Children.	Total.	Adult males.	Adult females.	Children.	Total.			
L.—CHROMITE ORE.																	
Baluchistan						Tons.											
		Quetta-Pishin	3	..	3	..	1,237	23	..	..	23	..	..	..	23	10	..
		Zhob	31	..	31	..	23,002	242	..	..	242	..	..	..	242	271	..
		TOTAL	34	..	34	..	24,310	265	..	..	265	..	..	..	265	281	..
Bihar and Orissa																	
		Singhbhum	3	..	3	..	914	51	40	23	120	..	..	..	120	20	11
		GRAND TOTAL (CHROMITE ORE) FOR 1923	37	..	37	..	25,233	316	40	23	385	..	..	..	385	301	11
		TOTAL OF PRECEDING YEAR	25	..	25	1	19,695	209	55	20	284	..	..	..	284	169	22
	DIFFERENCE	+12	..	+12	-1	+5,538	+107	-9	+3	+101	..	..	..	+101	+132	-11	..
M.—COPPER ORE.																	
Bihar and Orissa						Tons.											
		Singhbhum	4	3	1	3	4	6,550	1,238	5	..	1,243	..	..	1,243	046	452
		Balaghat	1	..	1	..	..	23	8	..	31	1	..	1	32	9	5
		GRAND TOTAL (COPPER ORE) FOR 1923	5	3	2	3	4	6,550	1,261	13	..	1,274	1	..	1	1,275	065
Central Provinces																	
		" " OF PRECEDING YEAR	5	2	3	2	4	30,764	821	6	..	827	4	..	4	1,329	326
	DIFFERENCE	..	+1	-1	+1	..	-21,211	+440	+7	..	+447	-3	..	-3	-374	-69	-18





Number of mines regulated by the Indian Mines Act, 1901, number of workers and output of minerals, during the year 1923—*contd.*

[illegible]

[illegible]

Table No. 1—concl'd.

Number of mines regulated by the Indian Mines Act, 1901, number of workers and output of minerals, during the year 1923—concl'd.

PROVINCE.	District and mineral field.	Number of mines under the scope of the Act.	NUMBER OF MINES INSPECTED DURING THE YEAR.		NUMBER OF MINES.	TOTAL OUTPUT.		AVERAGE NUMBER OF PERSONS EMPLOYED DAILY IN AND ABOUT THE MINES.								Grand total below and above ground.			
								BELOW GROUND.				ABOVE GROUND.							
			Number of mines inspected during the year.	Number of mines inspected during the year.	Not worked by mechanical power.	Worked by mechanical power.	Number of mines inspected.	MINERS.	OTHERS.	Total below ground.	Adult males.	Adult females.	Children.	Total above ground.					
X.—BARYTES.																			
Cwt.																			
Bihar and Orissa	Singbhum	1	..	..	1	..	..	58	33	91	..	..	..	1	13	104			
Madras	Kurnool	1	..	..	1	..	..	20	..	30	..	..	..	..	32	62			
	TOTAL	2	..	..	2	..	..	78	33	121	..	..	..	1	45	166			
	TOTAL OF PRECEDING YEAR	3	..	..	3	..	..	64	..	70	..	..	..	26	124	194			
	DIFFERENCE	-1	..	..	-1	..	..	+14	+33	+51	..	..	..	-25	-79	-28			
Y.—HYALITE.																			
Cwt.																			
Burma	Kattha	1	..	..	1	..	..	9	..	9	..	..	..	..	..	9			
	TOTAL OF PRECEDING YEAR	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			
	DIFFERENCE	+1	..	..	+1	..	..	+9	..	+9	..	..	..	..	..	+9			

GRAND TOTAL (ALL MINERALS) 1923 . . . . .	1,543	550	984	903	1,080	Tons. 20,306,307 Cwt. 188,493½ Carats 187,010 Troyounces 4,845,501	60,001	40,114	1,881	110,900	21,422	12,502	851	34,835	145,831	50,827	27,578	4,028	80,033	234,804
GRAND TOTAL OF PRECEDING YEAR . . . . .	1,618	555	1,063	877	1,769	Tons. 19,469,501 Cwt. 128,818 Carats 231,100 Troyounces 4,214,520	64,352	37,335	1,701	103,448	20,104	12,012	793	33,569	137,017	57,587	28,850	5,048	91,494	228,511
DIFFERENCE . . . . .	-75	+4	-79	+26	-80	Tons. +836,740 Cwt. +59,075½ Carats. -44,150 Troyounces +631,035	+4,040	+2,779	+120	+7,548	+1,258	-50	+58	+1,200	+8,814	-700	-1,281	-420	-2,401	+6,353

Table No. 2.

Analyses of figures relating to output of Coal and Coke.

Province	District and mineral field.	COAL.							COKE.								
		Opening stock.	Raisings.	TOTAL.	Despatches.	Colliery consumption.	Coal delivered to coking.	Coal despatched to coke factories.	Closing stock.	OPENING STOCK.		COKE MADE.		DESPATCHES.		CLOSING STOCK.	
										Hard.	Soft.	Hard.	Soft.	Hard.	Soft.	Hard.	Soft.
Assam	{ Lakhimpur Naga Hills Sibsagar	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
		32	270,343	270,375	258,638	9,956	1,226	..	555	..	409	..	409	..	409	..	..
		412	55,606	56,018	55,405	420	..	..	193	..	..	..	..	..	..	..	..
		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	TOTAL	444	325,949	326,393	314,043	10,376	1,226	..	748	..	409	..	409	..	..	..	..
Baluchistan	{ Kalat Loralai Quetta-Pishin Sibi-Khost	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		14	143	157	143	..	..	..	14	..	..	..	..	..	..	..	..
		1,164	4,979	6,143	4,338	..	..	..	1,805	..	..	..	..	..	..	..	..
		4,254	26,504	30,758	23,795	4,860	..	..	2,103	..	..	..	..	..	..	..	..
		5,432	31,626	37,058	28,276	4,860	..	..	3,922	..	..	..	..	..	..	..	..
Bengal	{ Bankura-Raniganj Birbhum Burdwan	1,712	8,510	10,222	7,647	1,738	..	..	837	..	..	..	..	..	..	..	..
		411	18,881	19,292	11,395	4,483	..	..	3,414	..	..	..	..	..	..	..	..
		222,001	4,594,187	4,816,791	3,662,590	698,535	14,509	..	441,157	15	383	747	8,005	418	7,646	344	742
		224,727	4,621,578	4,846,305	3,681,632	704,756	14,509	..	445,408	15	383	747	8,005	418	7,646	344	742
	TOTAL																

Bihar and Orissa	Hazaribagh	Bokaro	9,373	1,060,366	1,069,739	1,006,263	32,274	7,315	..	23,887	..	280	..	4,842	..	4,851	..	271
		Giridih	11,943	680,782	692,725	555,854	66,781	50,926	..	19,164	..	..	..	..	40,884	..	119	..
		Jharua	37,069	173,080	210,149	115,353	18,123	1,318	..	75,353	27	9	..	766	..	335	27	440
		Ramgarh	353	4,197	4,550	3,683	33	..	..	834	..	..	..	..	..	..	..	..
	Manbhum	Jharua	2,107,696	10,172,935	12,280,631	8,598,200	1,255,981	231,518	762,257	2,194,932	4,968	18,004	40,720	112,698	34,439	112,160	11,249	18,542
		Raniganj	170,762	849,545	1,020,307	512,780	139,347	144,105	..	224,075	39	9,239	81	93,374	72	94,590	48	8,023
		Palamau-Dalkonganj	11,043	11,815	22,858	5,737	3,700	..	..	13,421	..	..	..	..	..	..	..	..
		Sambalpur-Hingir-Rampur	849	50,796	51,645	31,310	19,878	..	..	457	..	..	..	..	..	..	..	..
	Sonthal Par- gunas.	Jainty	1,541	82,166	83,707	70,444	9,263	..	..	4,000	..	..	..	..	..	..	..	..
		Raniganj	8,009	86,301	94,310	62,806	15,762	100	..	15,642	..	..	..	64	..	31	..	33
Burma	Mergui	TOTAL	2,358,638	13,171,983	15,530,621	10,962,430	1,561,142	485,282	762,257	2,571,767	5,034	27,532	81,685	211,744	75,276	211,967	11,443	27,309
		..	..	163	163	163	..	..	..	..	..	..	..	..	..	..	..	..
		Southern Shan States	55	1,108	1,163	429	84	650	..	..	..	94	..	312	..	406	..	..
		TOTAL	..	1,271	1,326	592	84	650	..	..	..	94	..	312	..	406	..	..
	Central Provinces	Betul	559	2,048	2,607	760	..	..	..	1,847	..	..	..	..	..	..	..	..
		Chanda	4,879	112,362	117,241	85,970	24,888	..	..	6,383	..	..	..	..	..	..	..	..
		Chhindwara	23,496	346,094	369,590	301,359	37,835	..	..	30,396	..	..	..	..	..	..	..	..
		Narsinghpur	5,607	87,387	92,994	73,091	9,907	..	..	9,996	..	..	..	..	..	..	..	..
	Yeatmal	..	..	168	168	32	..	..	..	136	..	..	..	..	..	..	..	..
		TOTAL	34,541	548,059	582,600	461,212	72,630	..	..	48,758	..	..	..	..	..	..	..	..
Punjab	Jhelum	..	3,228	43,253	46,481	40,763	2,908	..	..	2,810	..	..	..	..	..	..	..	..
		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		..	1,633	11,965	13,598	12,396	31	..	..	1,171	..	..	..	..	..	..	..	..
		..	504	8,283	8,787	8,760	27	..	..	..	..	..	..	..	..	..	..	..
	Shahpur	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	TOTAL	..	5,365	63,501	68,866	61,919	2,966	..	..	3,981	..	..	..	..	..	..	..	..
		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	GRAND TOTAL 1923	..	2,629,202	18,763,967	21,393,169	15,510,104	2,356,814	451,667	762,257	3,074,584	5,049	28,009	82,841	220,061	76,103	220,019	11,787	28,051
		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

APPENDIX I—*contd.*

Table No. 3.

Number of mines opened and closed during the year ending 31st  
December 1923.

Province.	District.	Number of mines opened.	Number of mines closed.
<b>A.—COAL.</b>			
ASSAM . . . . .	Lakhimpur . . . . .	1	..
	Sibsagar . . . . .	..	..
	TOTAL . . . . .	1	..
BALUCHISTAN . . . . .	Kalat . . . . .	..	..
	Loralai . . . . .	..	..
	Quetta-Pishin . . . . .	1	1
	Sibi-Khost . . . . .	..	1
	TOTAL . . . . .	1	2
BENGAL . . . . .	Bankura . . . . .	..	1
	Birbhum . . . . .	..	3
	Burdwan-Raniganj . . . . .	11	36
	TOTAL . . . . .	11	40
BIHAR AND ORISSA . . . . .	Hazaribagh . . . . .	Bokaro . . . . .	..
		Giridih . . . . .	1
		Jharia . . . . .	3
		Ramgarh . . . . .	1
	Manbhum . . . . .	Jharia . . . . .	16
		Raniganj . . . . .	5
	Sambalpur-Hingir-Rampur . . . . .	..	1
	Sonthal Parganas . . . . .	Jainty . . . . .	2
		Raniganj . . . . .	..
	TOTAL . . . . .	28	105
BURMA . . . . .	Mergui . . . . .	1	..
	Southern Shan States . . . . .	1	2
	TOTAL . . . . .	2	2

APPENDIX I—*contd.*Table No. 3—*contd.*

Number of mines opened and closed during the year ending 31st  
December 1923—*contd.*

Province.	District.	Number of mines opened.	Number of mines closed.
CENTRAL PROVINCES . . . . .	Betul . . . . .	6	4
	Chanda . . . . .	1	4
	Chhindwara . . . . .	6	17
	Yeotmal . . . . .	..	1
	TOTAL .	13	26
PUNJAB . . . . .	Jhelum . . . . .	7	7
	Shahpur . . . . .	..	..
	TOTAL .	7	7
	TOTAL (COAL) .	63	182
B.—MICA.			
BIHAR AND ORISSA . . . . .	Gaya . . . . .	2	2
	Hazaribagh . . . . .	82	54
	Monghyr . . . . .	1	..
	Sambalpur . . . . .	2	1
	TOTAL .	87	57
MADRAS . . . . .	Nellore . . . . .	16	3
	Nilgiris . . . . .	1	1
	TOTAL .	17	4
RAJPUTANA . . . . .	Ajmer-Merwara . . . . .	4	10
	Beawar . . . . .	..	..
	TOTAL .	4	10
	TOTAL (MICA) .	108	71



APPENDIX I—*contd.*Table No. 3—*contd.*

Number of mines opened and closed during the year ending 31st  
December 1923—*contd.*

Province.	District.	Number of mines opened.	Number of mines closed.
<b>C.—MANGANESE ORE.</b>			
CENTRAL PROVINCES . . . . .	Balaghat . . . . .	13	..
	Bhandara . . . . .	2	..
	Chhindwara . . . . .	2	..
	Jubbulpore . . . . .	..	1
	Nagpur . . . . .	7	1
	TOTAL . . . . .	24	2
MADRAS . . . . .	Bellary . . . . .	1	..
	Vizagapatam . . . . .	5	2
	TOTAL . . . . .	6	2
	TOTAL (MANGANESE ORE) . . . . .	30	4
<b>D.—LIMESTONE.</b>			
Burma . . . . .	Northern Shan States . . . . .	1	..
CENTRAL PROVINCES . . . . .	Bilaspur . . . . .	..	..
	Jubbulpore . . . . .	2	6
	TOTAL (LIMESTONE) . . . . .	3	6
<b>E.—SLATE.</b>			
PUNJAB . . . . .	Gurdaspur . . . . .	..	..
	Gurgaon . . . . .	1	1
	Kangra . . . . .	..	1
	TOTAL (SLATE) . . . . .	1	2
<b>F.—IRON ORE.</b>			
BURMA . . . . .	Northern Shan States . . . . .	1	..
CENTRAL PROVINCES . . . . .	Chanda . . . . .	1	..
	TOTAL (IRON ORE) . . . . .	2	..

APPENDIX I—*contd.*Table No. 3—*concl'd.*

Number of mines opened and closed during the year ending 31st  
December 1923—*concl'd.*

Province.	District.	Number of mines opened.	Number of mines closed.
<b>G.—CHROMITE ORE.</b>			
BALUCHISTAN . . . . .	Quetta-Pishin . . . . .	3	..
	Zhob . . . . .	9	..
	TOTAL . . . . .	12	..
BIHAR AND ORISSA . . . . .	Singhbhum . . . . .	..	1
	TOTAL (CHROMITE ORE) . . . . .	12	1
<b>H.—COPPER ORE.</b>			
BIHAR AND ORISSA . . . . .	Singhbhum . . . . .	..	1
<b>I.—BAUXITE.</b>			
BOMBAY . . . . .	Kaira . . . . .	1	..
<b>J.—CLAY.</b>			
CENTRAL PROVINCES . . . . .	Jubbulpore . . . . .	1	..
DELHI . . . . .	Delhi . . . . .	4	4
....	TOTAL (CLAY) . . . . .	5	4
<b>K.—LEAD ORE.</b>			
BURMA . . . . .	Southern Shan States . . . . .	2	..
<b>L.—TIN AND WOLFRAM ORE.</b>			
BURMA . . . . .	Mergui . . . . .	8	..
	Tavoy . . . . .	5	..
	Thaon . . . . .	..	..
	TOTAL (TIN ORE) . . . . .	13	..
<b>M.—GRAPHITE.</b>			
CENTRAL PROVINCES . . . . .	Betul . . . . .	..	1
<b>N.—OCHRE.</b>			
CENTRAL PROVINCES . . . . .	Jubbulpore . . . . .	..	2
<b>O.—BARYTES.</b>			
BIHAR AND ORISSA . . . . .	Singhbhum . . . . .	1	..
MADRAS . . . . .	Kurnool . . . . .	1	1
	TOTAL (BARYTES) . . . . .	2	1
<b>P.—HYALITE.</b>			
BURMA . . . . .	Katha . . . . .	..	1
	GRAND TOTAL (ALL MINES) . . . . .	242	276

APPENDIX I—*contd.*

Table No. 4.

Fluctuations in the output of the principal minerals raised from mines classed under the Indian Mines Act, 1901. The other minerals raised are gems, slate, magnesite, steatite, clay, bauxite, fuller's earth, graphite, molybdenite, ochre, barytes, apatite, calcite and hyalite.

YEAR.	Coal.	Manga- nese ore.	Allica.	Lime- stone.	Salt.	Gold.	Cop- per ore.	Wol- fram ore.	Iron ore.	Chro- mite ore.	Tin ore.	Lead ore.	Silver.
	Tons.	Tons.	Cwt.	Tons.	Tons.	Troy ozs.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Troy ozs.
1914 .	15,727,631	555,672	38,189	146,505	135,518	19,873	4,400	1,576	167,600	3,006	45	3½	..
1915 .	16,352,480	378,172	24,063	64,179	144,770	24,320	8,010	1,072	126,617	1,465	14	7	612
1916 .	16,419,082	568,032	35,978	45,290	160,357	23,235	2,671	2,955	142,606	5,004	88	7	1,362
1917 .	17,326,384	497,052	35,806	82,340	152,542	22,991	20,108	3,966	178,303	17,266	182	..	1,281
1918 .	19,847,039	415,357	51,572	131,451	158,513	19,916	3,610	3,609	115,890	24,030	602	3	1,160
1919 .	21,759,727	420,184	41,683	146,810	174,974	11,191	32,756	2,905	101,322	14,067	701	2½	753
1920 .	17,082,711	582,636	44,666½	161,340	181,092	13,645	28,167	1,733½	148,472	23,123	1,056	128,908	2,870,595
1921 .	18,358,934	284,254	29,470	284,252	123,084	10,108	32,560	884½	286,190	27,727	1,032	144,089½	3,555,640
1922 .	18,168,988	392,322	30,089	140,507	187,157	8,388	30,764	942	240,383	19,695	1,080	172,018	4,206,138
1923 .	18,763,967	546,378	31,605	236,161	113,700	1,510	6,550	872	202,033	25,233	1,021	245,925	4,844,042

Table No. 5.

Amount of coal raised, the average number of persons working daily and the death-rates during the years 1914 to 1923 in respect of coal mines under the Indian Mines Act, 1901 :—

YEAR.	Amount of coal raised.	Average number of persons work- ing daily below and above ground.	Number of deaths below and above ground.	DEATH-RATES.	
				Per 1,000,000 tons raised.	Per 1,000 per- sons working daily below and above ground.
	Tons.				
1914 . . . . .	15,727,631	137,851	145	9.22	1.05
1915 . . . . .	16,352,480	145,537	166	10.15	1.14
1916 . . . . .	16,419,082	143,459	169	10.29	1.18
1917 . . . . .	17,326,384	153,683	163	9.41	1.06
1918 . . . . .	19,847,039	176,269	197	9.93	1.12
1919 . . . . .	21,759,727	190,052	260	11.95	1.37
1920 . . . . .	17,082,711	175,943	172	10.07	0.98
1921 . . . . .	18,358,934	190,617	257	13.99	1.35
1922 . . . . .	18,168,988	184,355	209	11.50	1.13
1923 . . . . .	18,763,967	182,601	332	17.69	1.82

APPENDIX I—*contd.*

Table No. 6.

Aggregate horse power and purpose for use of electric motors installed both on the surface and underground at coal mines under the Indian Mines Act, 1901 :—

Coal-field.	HORSE POWER ON SURFACE.						HORSE POWER BELOW GROUND.					Total horse power of motors installed.
	Wind-ing.	Venti-lation.	Haulage.	Coal wash-ing or screen-ing.	Miscel-laneous.	TOTAL.	Haul-age.	Pump-ing.	Port-able machi-nery.	Miscel-laneous.	TOTAL.	
Assam . . .	..	..	..	..	..	..	..	30	..	..	30	30
Dokaro . . .	..	..	..	..	22	22	..	..	..	..	..	22
Burma . . .	12	..	..	..	..	12	..	..	..	..	..	12
Central Provinces	..	130	..	50	60	270	91	322	..	..	413	683
Giridih . . .	..	..	..	110	58	168	105	960	15	..	1,080	1,248
Jharia . . .	2,025	407	1,781	271	702	5,186	2,991	10,842	1,619	289	15,741	20,927
Raniganj . . .	2,402	928	680	225	188	4,423	2,608	4,883	967	205	8,663	13,086
TOTAL . . .	4,439	1,495	2,461	656	1,030	10,081	5,795	17,037	2,601	494	25,927	36,008

Table No. 7.

Number of mines under the Indian Mines Act, 1901, where electrical power is used, and the aggregate horse power of electric motors installed :—

Province,	MINERALS WORKED.						Total horse power of motors installed.
	COAL.		CLAY.		SUNDRY MINERALS.		
	Number of mines.	Horse power.	Number of mines.	Horse power.	Number of mines.	Horse power.	
Assam . . . . .	1	30	..	..	..	..	30
Bengal . . . . .	34	10,238	..	..	..	..	10,238
Bihar and Orissa . . .	53	25,045	..	..	1	1,656	26,701
Burma . . . . .	1	12	..	..	5	3,098	3,110
Central Provinces . . .	2	683	1	60	1	49	792
TOTAL . . . . .	91	36,008	1	60	7	4,803	40,871

## APPENDIX I—concl'd.

Table No. 8.

Number and type of coal cutting machines at work in coal mines under the Indian Mines Act, 1901 :—

Maker.	British.	American	Chain	Bar.	Percus- sion.	POWER.			Total number of machines.
						Electricity.		Compressed air.	
						A. C.	D. C.		
Anderson Boyes . . .	2	..	2	..	..	2	..	..	2
Diamond . . . . .	1	..	1	..	..	1	..	..	1
Goodman . . . . .	..	23	23	..	..	16	7	..	23
Hardfax . . . . .	12	..	..	..	12	..	..	12	12
Ingersoll Rand . . .	..	3	..	3	..	..	..	3	3
Mavor and Coulson . .	27	..	..	27	..	24	..	3	27
Siskol . . . . .	5	..	..	..	5	..	..	5	5
Sullivan . . . . .	..	20	20	..	..	20	..	..	20
TOTAL . . . . .	47	46	46	30	17	63	7	23	93

Jharia coal-field . . . . .	44 machines.	} Total number of square feet undercut 3,230,584.
Raniganj „ . . . . .	42 „	
Bokaro „ . . . . .	1 machine.	
Central Provinces . . . . .	3 machines.	
Punjab . . . . .	3 „	

Table No. 9.

Number of mechanical ventilators in use at coal mines under the Indian Mines Act, 1901 :—

Assam.	Bengal.	Bihar and Orissa.	Central Provinces.	Punjab.	TOTAL.
10	11	24	9	1	55

Table No. 10.

Number of safety lamps in use at coal mines under the Indian Mines Act, 1901 :—

Assam.	Baluchistan.	Bengal.	Bihar and Orissa.	Central Provinces.	Punjab.	TOTAL.
1,698	1,253	6,026	2,793	1,499	3	13,272

1,453 were locked by screws, 7,562 by lead rivets and 4,257 by magnetic means.

# APPENDIX II.

## ACCIDENTS IN MINES.

Table No. 1.

List of Fatal Accidents in mines regulated by the Indian Mines Act, 1901, during the year 1923.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Cause of accident and remarks.
1	4th January, 7 A.M.	Parbelia mine, Disergarh P. O., Bihar and Orissa.	Bengal Coal Co., Ltd.	<b>EXPLOSIONS AND IGNITIONS OF FIRE-DAMP—(75 deaths).</b>  Sudhir Kumar Ghosh, (m.), 22, Overman ; Atvary Barhi, (m.), 30, Sirdar ; Hari Singh, (m.), 23, Jeo Hazra, (m.), 38, Bhatoo Ram, (m.), 33, Bodi Singh, (m.), 24, Jaffoor Meah, (m.), 34, Jadu Shaw, (m.), 31, Bakoo Lall Shaw, (m.), 28, Puran Singh, (m.), 25, Jegon Barhi, (m.), 20, Bhatoo Meah, (m.), 35, Bhola Singh, (m.), 26, Hari Singh, (m.), 27, Datu Roy, (m.), 22, Stone-cutters ;		The deceased were killed by an explosion of coal dust in the underground workings of the mine. Inspection and inquiry made.
					Coal	

# APPENDIX II—*contd.*

## Fatal Accidents, 1923—*contd.*

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Cause of accident and remarks.
1—( <i>contd.</i> )			EXPLOSIONS AND IGNITIONS OF FIRE-DAMP—(75 deaths)— <i>contd.</i>			
				<p>Gonori Barhi, (m.), 38,  Basoo Mahaton, (m.), 25,  Taloo Meah, (m.), 33,  Khagoo Meah, (m.), 30,  Tajoo Barhi, (m.), 27,  Dooli Meah, (m.), 25,  Bhikoo Meah, (m.), 38,  Nabi Meah, (m.), 22,  Fagon Gope, (m.), 27,  Dhari Teli, (m.), 33,  Dukhon Teli, (m.), 28,  Saleram Teli, (m.), 37,  Molhon Singh, (m.), 40,  Balchand Gope, (m.), 49,  Niroo Meah, (m.), 25,  Rotu Baurin, (f.), 22,  Chari Baurin, (f.), 15,  Kumari Baurin, (f.), 14,  Sarali Baurin, (f.), 13,</p>		

Triguni Baurin,  
 (f.), 14,  
 Dooli Baurin,  
 (f.), 21,  
 Fuki Baurin,  
 (f.), 18,  
 Tushi Baurin,  
 (f.), 37,  
 Januna Baurin (1),  
 (f.), 20,  
 Januna Baurin (2),  
 (f.), 18,  
 Polu Baurin,  
 (f.), 16,  
 Suki Baurin,  
 (f.), 45,  
 Kamini Baurin,  
 (f.), 17,  
 Chuni Baurin,  
 (f.), 18,  
 Tulshi Majhian,  
 (f.), 27,  
 Moni Majhian,  
 (f.), 29,  
 Pari Majhian,  
 (f.), 23,  
 Rani Majhian,  
 (f.), 27,  
 Rojoni Majhian,  
 (f.), 23,  
 Lobin Majhian,  
 (f.), 15,  
 Tupli Majhian,  
 (f.), 22,  
 Pudi Majhian,  
 (f.), 21,  
*Coal-carriers ;*  
 Khapa Manjhi,  
 (m.), 29,  
 Kishoon Manjhi,  
 (m.), 35,  
 Bali Manjhi,  
 (m.), 33,  
 Sitaram Manjhi,  
 (m.), 33,  
 Bhim Manjhi,  
 (m.), 30,  
 Monsa Manjhi,  
 (m.), 26,  
 Dasoo Manjhi,  
 (m.), 33,  
 Budha Manjhi,  
 (m.), 16,



# APPENDIX II—*contd.*

## Fatal Accidents, 1923—*contd.*

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Cause of accident and remarks.
1—( <i>concl.</i> )				<p>EXPLOSIONS AND IGNITIONS OF FIRE-DAMP—(75 deaths)—<i>concl.</i></p> <p>Rabon Manjhi, (m.), 24, Tata Manjhi, (m.), 14, Mochak Manjhi, (m.), 30, Chandra Manjhi, (m.), 20, Dukhoo Manjhi, (m.), 25, Coal-cutters ; Lall Singh, (m.), 36, Faijoo Singh, (m.), 37, Coal-cutting Machine men ; Adhor Bauri, (m.), 25, Hari Bauri, (m.), 20, Shomro Bauri, (m.), 25, Rojoni Bauri, (m.), 26, Saboo Bauri, (m.), 22, Jugal Bauri, (m.), 28, Rojon Bauri, (m.), 31, Trolley-men.</p>		
2	2nd November, 7 A.M.	Deoli mine, Disergarh P. O., Bihar and Orissa.	Deoli Coal Co., Ltd.	<p>Chiuna Manjhi, (m.), 19, Coal-cutter.</p>	Coal	Deceased ignited a small accumulation of fire-damp at the face of an advance gallery and was so severely burnt that he died a few days later. Inspection and inquiry made.

# FALLS OF ROOF AND SIDES.

(a) Falls of roof—(92 deaths).

3	9th January, 9-30 P.M.	New Ghusick mine, Kalipahari P. O., Bengal.	New Ghusick Coal Co.	Bara Sukha Manjhi, (m.), 28, Coal-cutter.	Coal	Deceased was ordered to dress down some overhanging roof coal at the side of a pillar where he was working. Contrary to orders he commenced cutting the side of the pillar beneath the overhanging coal. He thus released a mass of roof coal, 4' x 3' x 9", which fell on him from a height of 9 feet. He sustained serious injuries to which he succumbed an hour later. Inspection and inquiry made.
4	28th January, 3-10 P.M.	Bawdwin mine, Namtu P. O., Northern Shan States, Burma.	Burma Corporation, Ltd.	Thon Tsi, (m.), 31, Miner.	Silver-Lead-Zinc	Whilst the deceased was barring down loose ground in a stope a piece of heavy ore fell on him, killing him instantly. Inspection and inquiry made.
5	1st February, 11-50 A.M.	Bawdwin mine, Namtu P. O., Northern Shan States, Burma.	Burma Corporation, Ltd.	Dhan Singh, (m.), 44, Miner.	Silver-Lead-Zinc	Deceased attempted to take out the old "sets" of timber in a roadway before fixing the new "sets" properly. He was killed by the subsequent fall of ground. Inspection and inquiry made.
6	5th February, 7-30 P.M.	Sudi mine, Sitarampur P. O., Bengal.	Movarji Mulraj & Co.	Chand Manjhi, (m.), 35, Sirdar.	Coal	Deceased was killed by a fall of roof which occurred while he was withdrawing props. Inspection and inquiry made.
7	10th February, 2-30 A.M.	Chanch mine, Barakar P. O., Bihar and Orissa.	Bengal Coal Co., Ltd.	Lakhoo Manjhi, (m.), 22, Coal-cutter.	Coal	Deceased went through a fence and was killed by a mass of roof stone, 8' x 4' x 6", which fell from a height of 7 feet. Inspection and inquiry made.
8	11th February, 7-30 P.M.	Khost mine, Khost P. O., Baluchistan.	North Western Railway	Gulab, (m.), 28, Labourer.	Coal	Whilst engaged in timbering an inclined shaft deceased was struck on the head and killed by a slab of stone, 2' x 2' x 6" which fell, from the roof. Inspection and inquiry made.
9	17th February, 1 P.M.	Shampore mine, Mugma P. O., Bihar and Orissa.	Shampore Coal Co., Ltd.	Choudhury Bauri, (m.), 40, Coal-cutter.	Coal	Deceased went through a fence and while robbing coal was injured by a mass of roof coal, 12' x 4' x 18", which fell from a height of 8 feet. He died four days later. Inspection and inquiry made.
10	20th February, 2 P.M.	Raniganj mine, Raniganj P. O., Bengal.	Bengal Coal Co., Ltd.	Upendra Bauri, (m.), 35, Judhistir Bauri, (m.), 40, Khara Manjhi, (m.), 19, Lordha Manjhi, (m.), 27, Coal-cutters.	Coal	The four deceased were killed by a mass of stone, 26' x 12' x 4', weighing over 30 tons, which fell without warning from a "slip" in the roof. One other person was seriously injured. Inspection and inquiry made.
11	22nd February, 2 P.M.	Burra Golai mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ltd.	Kantaram Gogoi, (m.), 17, Mason.	Coal	Whilst deceased was assisting in the erection of masonry support at a point where a previous fall had occurred, he was killed by a slab of stone, weighing about 5 tons, which fell without warning. Inspection and inquiry made.

# APPENDIX II—contd.

## Fatal Accidents, 1923—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Cause of accident and remarks.
<b>FALLS OF ROOF AND SIDES—contd.</b>						
<i>(a) Falls of roof—(92 deaths)—contd.</i>						
12	24th February, 1 A.M.	Lodna mine, Jharia P. O., Bihar and Orissa.	Lodna Colliery Co. (1920), Ltd.	Alidasi Rajvarin, (f.), 35, Coal-carrier.	Coal	While deceased was returning to the face of the gallery in which she was working, a mass of coal, 15'×12'×6", fell from a "slip" in the roof (about 20 feet high), killing her instantly. Inspection and inquiry made.
13	24th February, 12-30 P.M.	Chugus mine, Ballarpur P. O., Central Provinces.	Sir K. C. Daga & Bros. and Hon'ble Sir M. B. Dadabhoy	Bajinath, (m.), 18, Trammer.	Coal	Against orders and for the purpose of loading coal, deceased went into a place after blasting had been done. A piece of shale 3'×2'×2" fell from the roof, 7 feet above, and struck him on the foot. He died from blood poisoning two months later. Inspection and inquiry made.
14	25th February, 5 A.M.	Sonardih mine, Katragarh P. O., Bihar and Orissa.	Baraboni Coal Concern, Ltd.	Ugar Thakore, (m.), 35, Coal-cutter.	Coal	Deceased was filling his basket in an underground gallery, when some roof stone fell and broke his leg. He died fourteen days later. Inspection and inquiry made.
15	2nd March, 4 A.M.	Bankola mine, Ulkhra P. O., Bengal.	Burrakur Coal Co., Ltd.	Mehor Sheikh, (m.), 28, Ann Sheikh, (m.), 23, Labourers.	Coal	The deceased in spite of being warned not to do so, walked into a gallery, the roof of which was known to be unsound. A piece of shale, weighing 2 cwt., fell upon them from a height of 16 feet. Ann Sheikh was killed instantly, and the other man sustained injuries which appeared to be slight but died of shock shortly afterwards. Inspection and inquiry made.
16	2nd March, 9 A.M.	Ledo Valley mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ltd.	Arjoon Gowala, (m.), 20, Labourer.	Coal	Whilst deceased was loading coal in a gallery, 5'×5', he was buried by a mass of roof coal which fell without warning from a "slip." He received injuries from which he died ten days later. Inspection and inquiry made.
17	7th March, 10-45 A.M.	Chugus mine, Ballarpur P. O., Central Provinces.	Sir K. C. Daga & Bros. and Hon'ble Sir M. B. Dadabhoy	Goria Panchan, (m.), 15, Trammer.	Coal	Deceased, against orders, went into a place after it had been blasted to load coal. A piece of coal, 5'×3'×2', fell from the roof, a height of 6 feet. He was killed instantly. Inspection and inquiry made.
18	8th March, 10-30 A.M.	Bawdwin mine, Namtu P. O., Northern Shan States, Burma.	Burma Corporation, Ltd.	Leo Chan Chuai, (m.), — Miner.	Silver-L ead- Zinc	Whilst deceased was engaged in timbering some weak ground he was killed by a fall of roof. Inspection and inquiry made.

19	10th March, 9-30 A.M.	Jharia Khas mine, Jharia P. O., Bihar and Orissa.	Standard Coal Co., Ltd.	Maikoo Chamar, (m.), 40, <i>Coal-cutter.</i>	Coal	Deceased was loading coal in an underground gallery, when a block of coal, weighing about 7 tons, fell and killed him instantly. Inspection and inquiry made.
20	12th March, 8 P.M.	Nandi mine, Nandi P. O., Bengal.	Adjai Coal Co., Ltd.	Jirooa Chamarin, (f.), 40, <i>Coal-carrier.</i>	Coal	Deceased went through a fence to load loose coal and was killed instantly by a mass of roof stone which fell from a "slip" in the roof. Inspection and inquiry made. <sup>11</sup>
21	22nd March, 12-30 A.M.	Sripore mine, Kalipahari P. O., Bengal.	Lodna Colliery Co., (1920) Ltd.	Hopni Majhian, (f.), 20, Makhani Majhian, (f.), 32, <i>Coal-carriers.</i>	Coal	The deceased and another woman were loading coal from a pillar under extraction, when a mass of roof stone, 45' × 20' × 3', fell without warning from a height of 15 feet. The deceased were killed instantly, and the other woman was seriously injured. Inspection and inquiry made.
22	30th March, 11 A.M.	Baidyanathpur mine, Pandaveswar P. O., Bengal.	Samla Govindpur Collieries, Ltd.	Budni Kolin, (f.), 55, <i>Coal-carrier.</i>	Coal	Roof coal was being wedged down when deceased was struck by mass of it, weighing about 2 tons, which fell from a height of 10 feet. She was killed instantly. Inspection and inquiry made.
23	5th April, 2 P.M.	Central Nodiha mine, Ukhra P. O., Bengal.	Central Nodiha Colliery Co., Ltd.	Maku Majhian, (f.), 17, <i>Coal-carrier.</i>	Coal	Whilst coal was being stripped from the side of a gallery, a mass of roof stone 11' × 24' × 9", fell from height of 6 feet, killing deceased instantly. A miner was also injured. Inspection and inquiry made.
24	14th April, 10 A.M.	Rawanwara mine, Pench, P. O., Central Provinces.	H. Verma and Kanhaivalal, Ltd.	Jungi, (f.), 14, Mst. Haswa, (f.), 15, Mst. Agasia, (f.), 45, Baboo Lal, (m.), 14, Giridhari, (m.), 13, Putta, (m.), 13, Mahabir, (m.), 13, Tota, (m.), 15, Sahadeo, (m.), 33, Mst. Juggi, (f.), 13, <i>Labourers;</i> Baora, (m.), 20, Pannoo, (m.), 30, Amilall, (m.), 40, <i>Coal-cutters;</i>	Coal	Whilst three of the deceased were engaged in setting timber in a mine, where pillars were being partially extracted, the workings collapsed, and they were killed. The air in the mine was expelled with such violence through the inclined entrances from the surface that twelve persons were killed and two injured outside the mine. One of the latter died two months later. Inspection and inquiry made.

# APPENDIX II—contd

## Fatal Accidents, 1923—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Cause of accident and remarks.
<p><b>FALLS OF ROOF AND SIDES—contd.</b></p> <p>(a) Falls of roof—(92 deaths)—contd.</p>						
25	24th April, 5 A.M.	Bhutgoria mine, Jamadoba P. O., Bihar and Orissa.	Aldih Coal Co., Ltd.	Muria, (m.), 45, Contractor ; Muria, (m.), 35, Timberman; Mst. Parvati, (f.), 35, Not employed.	Coal	While cutting coal, deceased was struck by a piece of stone bands 5'×2'×1', which fell from a height of 8 feet. He received injuries from which he died shortly afterwards. Inspection and inquiry made.
26	24th April, 6-30 A.M.	Khost mine, Khost P. O., Baluchistan.	North Western Railway	Rustam, (m.), 32, Coal-cutter.	Coal	Deceased was injured by a fall of roof in his working place. He died four days later. Inspection and inquiry made.
27	24th April, 2 P.M.	Huriladib mine, Jamadoba P. O., Bihar and Orissa.	Equitable Coal Co., Ltd.	Gouri Prosad Gosain, (m.), 30, Overman.	Coal	While the roof of a gallery was being tested by a roof dresser, a piece of coal, 13'×4'×2½', fell from a "slip" in the roof—a height of 8 feet. Deceased, who was standing near, was killed instantly, and another person was injured. Inspection and inquiry made.
28	27th April, 9-30 P.M.	Pandaveswar mine, Pandaveswar P. O., Bengal.	Highfield Colliery, Ltd.	Sonku Manjhi, (m.), 45, Coal-cutter.	Coal	Deceased was robbing coal from a fenced-off gallery, when a piece of roof coal, weighing over 3 tons, fell and killed him instantly. Inspection and inquiry made.
29	3rd May, 4-30 A.M.	Dishergarh mine, Dishergarh P. O., Bengal.	Equitable Coal Co., Ltd.	Mungia Chamarin, (f.), 20, Labourer.	Coal	Whilst fallen coal was being loaded in a district which was being reopened, a mass of roof stone, 50'×10'×3', fell from a height of 15 feet. Deceased was struck by the falling stone and was killed. Inspection and inquiry made.

30	10th May, 1 P.M.	Joyrampur mine, Jharia P. O., Bihar and Orissa.	B. R. & Co.	Chakor Bauri, (m.), 25, <i>Coal-cutter</i> ; Sabi Baurin, (f.), 20, <i>Coal-carrier</i> .	Coal	Whilst three coal-cutters were engaged in widening a roadway for a tram line, a mass of roof coal 20' × 12' × 3', fell upon them from a concealed "slip" at a height of 7 feet. They were killed instantly. Inspection and inquiry made.
31	12th May, 4-45 P.M.	Khost mine, Khost P. O., Baluchistan.	North Western Railway	Mir Mahomed, (m.), 28, <i>Packer</i> .	Coal	Deceased was removing a wooden plank from a goaf when a fall of roof occurred killing him instantly. Inspection and inquiry made.
32	10th May, 4 P.M.	South Mudidih mine, Sijua P. O., Bihar and Orissa.	Burrakur Coal Co., Ltd.	Ramdih Kurmi, (m.), 28, <i>Coal-cutter</i> .	Coal	Deceased was standing on a ladder and levering down roof coal at a height of 18 feet. He overbalanced and fell from the ladder and sustained serious injuries which terminated fatally shortly afterwards. Inspection and inquiry made.
33	25th May, 3 P.M.	Ekra Khas mine, Bansjora P. O., Bihar and Orissa.	Maharaja of Cossimbazar	Pindu Majhian, (f.), 20, <i>Coal-carrier</i> .	Coal	Deceased was sitting near a place where roof coal was being dressed down, when a piece of coal weighing about 30 lb., fell upon her from a height of 10 feet, causing serious injuries. She died of shock five hours later. Inspection and inquiry made.
34	30th May 12-30 P.M.	Jinagara mine, Jharia P. O., Bihar and Orissa.	New Jinagara Coal Co., Ltd.	Nanki Panka, (m.), 45, <i>Coal-cutter</i> .	Coal	Deceased was dressing down some overhanging roof coal, when a mass of coal, weighing about 8 cwt., fell upon him from a "slip" at a height of 5 feet. He was killed instantly. Inspection and inquiry made.
35	1st June, 12 P.M.	Alkusa South mine, Kusunda P. O., Bihar and Orissa.	Raneegunge Coal Association, Ltd.	Dhanias Meah, (m.), 22, <i>Coal-cutter</i> .	Coal	Deceased was struck by a piece of coal, 10' × 8' × 6', which fell from the roof—a height of 13 feet. He was killed instantly. Inspection and inquiry made.
36	4th June, 11-30 P.M.	Garh Dhemo mine, Charampur P. O., Bengal.	Garh Dhemo Coal Co.	Ramu Singh, (m.), 35, <i>Coal-cutter</i> .	Coal	Deceased, whilst working in an underground gallery, was killed instantly by a fall of roof stone weighing about 1 ton. Inspection and inquiry made.
37	16th June, 5-30 A.M.	Sanctoria mine, Disergarh P. O., Bengal.	Bengal Coal Co., Ltd.	Gokul Mahaton, (m.), 55, <i>Coal-cutter</i> .	Coal	Deceased went through a fence to load fallen roof coal and was killed by a mass of roof stone, 20' × 12' × 18", which fell from a height of 14 feet. Inspection and inquiry made.
38	18th June, 10-30 A.M.	Malkera mine, Katragarh P. O., Bihar and Orissa.	Tata Iron & Steel Co., Ltd.	Guru Charan, (m.), 35, <i>Labourer</i> .	Coal	A fall of roof, 18' × 15' × 3'-6", took place at a junction on a haulage road. The brick and steel supports collapsed. Deceased was struck and killed by a falling girder. Inspection and inquiry made.
39	15th July, 6 A.M.	Benahir mine, Jharia P. O., Bihar and Orissa.	Standard Coal Co., Ltd.	Amrit Rajawar, (m.), 26, <i>Coal-cutter</i> .	Coal	Whilst deceased was cutting floor coal in a gallery, a mass of stone, 3' × 2' × 2', fell upon him from a height of 17 feet. He sustained serious injuries to which he succumbed ten hours later. Inspection and inquiry made.
40	28th July, 1 A.M.	Ledo Valley mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ltd.	Jion Megan, (m.), 20, <i>Labourer</i> .	Coal	Whilst deceased was loading coal near the entrance of an "opening" or chamber, a mass of roof coal, weighing about 2 tons, fell upon him from a height of 20 feet. He was killed instantly. Inspection and inquiry made.

# APPENDIX II—contd.

## Fatal Accidents, 1923—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Cause of accident and remarks.
<b>FALLS OF ROOF AND SIDES—contd.</b>						
<i>(a) Falls of roof—(92 deaths)—contd.</i>						
41	7th August, 11-45 A.M.	Ghusick mine, Kalipahari P. O., Bengal.	Ghusick and Muslia Collieries, Ld.	Baharam Manjhi, (m.), 28, Coal-cutter.	Coal	Whilst deceased was cutting coal in a fenced-off gallery he was killed by a mass of roof stone, 8'×4'×9", which fell from a height of 6 feet. Inspection and inquiry made.
42	17th August, 8 A.M.	Bhagaband mine, Jharia, P. O., Bihar and Orissa.	Borrea Coal Co., Ld.	Bhatu Gope, (m.), 45, Timberman.	Coal	Whilst deceased was withdrawing timber from beneath an unsound roof in a road, 12 feet wide, a mass of stone, 12'×4'×1', suddenly fell away and forced out a prop which struck deceased and pinned him against the side. He sustained serious injuries to which he succumbed one hour later. Inspection and inquiry made.
43	31st August, 11-50 A.M.	Tikak mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ld.	Sakina Mussalman, (f.), 24, Labourer.	Coal	Deceased was assisting to clean up the dirt from a new level road preparatory to laying a tram line, when a mass of roof coal, weighing about 2 cwt., fell upon her from a height of 6 feet. She succumbed to her injuries shortly afterwards. Inspection and inquiry made.
44	4th September, 6 P.M.	Dishergarh mine, Dishergarh P. O., Bengal.	Equitable Coal Co., Ld.	Sakhu Kuri, (m.), 18, Coal-cutter.	Coal	Whilst deceased was loading coal which had been blasted down from a pillar, a mass of roof coal, weighing about 1 ton, fell from a "slip" in the roof killing the deceased instantly. Inspection and inquiry made.
45	8th September, 5 P.M.	South East Baraboni mine, Charanpur P. O., Bengal.	Maharaja of Cossimbazar	Noona Kole, (m.), 18, Jhaboo Kole, (m.), 50, Coal-cutters.	Coal	Whilst the deceased, with others, were engaged in extracting a pillar adjacent to a goaf from which the props had just been withdrawn, a mass of roof coal, 20'×24'×1' fell from a height of 14 feet. Noona was killed instantly and Jhaboo succumbed to his injuries nine days later. Three other persons were injured. Inspection and inquiry made.
46	20th September, 5-30 A.M.	Alkusa North mine, Kusunda P. O., Bihar and Orissa.	Raneegunge Coal Association, Ld.	Kunta Bhaktani, (f.), 20, Coal-carrier.	Coal	Deceased and two other persons passed through a fence and entered a roadway to which access was forbidden. They were struck by a mass of stone, 12'×9'×2", which fell from the roof, 8 feet above. Deceased was killed instantly, and the other two persons received serious injuries. Inspection and inquiry made.
47	20th September, 8-15 A.M.	Sripore mine, Kalipahari P. O., Bengal.	Lodna Colliery Co., (1920) Ld.	Sowraj Gowala, (m.), 35, Coal-cutter.	Coal	After shots had been fired, deceased, using a long pole, attempted to get down some roof coal. A mass of about 6 tons of this coal fell and killed him instantly. Inspection and inquiry made.

48	22nd September, 2-30 A.M.	New Tetturya mine, Katragarh P. O., Bihar and Orissa.	New Tetturya Coal Co., Ltd.	Khooroo Dhoobi, (m.), 33, Mangfoo Marar. (m.), 35, <i>Coal-cutters.</i>	Coal	The deceased were cutting coal, when a mass of roof coal, $18' \times 10' \times 1'-6''$ , fell away from between two "slips" at a height of 8 feet and forced out some props which struck the deceased. Khooroo was killed instantly and Mangloo sustained serious injuries to which he succumbed three hours later. Inspection and inquiry made.
49	26th September, 9-30 A.M.	Lodna mine, Jharia P. O., Bihar and Orissa.	Lodna Colliery Co., (1920) Ltd.	Gopal Turi, (m.), 45, <i>Coal-cutter.</i>	Coal	Coal cutting was being done near a fenced-off area. Deceased passed through the fence, when a mass of stone, weighing 50 tons, fell upon him from between two converging "slips" at a height of 25 feet. He was killed instantly. Inspection and inquiry made.
50	27th September, 8 P.M.	Victoria mine, Kulti P. O., Bengal.	New Beerbhoom Coal Co., Ltd.	Khudi Ram Bauri, (m.), 26, <i>Coal-cutter.</i>	Coal	Deceased passed under some roof-stone, which another miner was dressing. A large piece of stone fell and broke his neck. Inspection and inquiry made.
51	28th September, 5-30 A.M.	Sendra mine, Bansjora P. O., Bihar and Orissa.	Sendra Coal Co., Ltd.	Puran Roy, (m.), 32, <i>Coal-cutter.</i>	Coal	Deceased, whilst engaged in extracting a portion of a pillar of coal, was struck by a piece of stone, $6' \times 2' \times 9''$ , which fell from the roof, a height of 9 feet. He was killed instantly. Inspection and inquiry made.
52	13th October, 1-30 P.M.	Victoria mine, Kulti P. O., Bengal.	New Beerbhoom Coal Co., Ltd.	Ghunarur Bilaspuri, (m.), 18, <i>Coal-cutter.</i>	Coal	After blasting, the deceased returned to his working place without authority and was killed by a fall of roof coal. Inspection and inquiry made.
53	15th October, 6-30 A.M.	Joyrandanga mine, Asansol P. O., Bengal.	New Beerbhoom Coal Co., Ltd.	Chandwa Kolt, (m.), 45, <i>Coal-cutter.</i>	Coal	Deceased went through a fence into a goaf to get fallen coal. He was killed by a fall of stone from the roof. Inspection and inquiry made.
54	16th October, 5 A.M.	Rampur mine, Jharsaguda P. O., Bihar and Orissa.	Hingir-Rampur Coal Co., Ltd.	Goenl Munda, (m.), 30, <i>Coal-cutter.</i>	Coal	After blasting in roof coal deceased was engaged in getting down loose coal. A slab of shale $3' \times 2'-6'' \times 2''$ fell on his head and killed him instantly. Inspection and inquiry made.
55	30th October, 6-30 A.M.	Bhuggutdih mine, Jharia P. O., Bihar and Orissa.	Bengal Nagpur Coal Co., Ltd.	Rudan Chamar, (m.), 42, <i>Coal-cutter.</i>	Coal	Deceased left his appointed working place, passed through a fence, and was robbing coal from the side of a pillar, when a mass of coal weighing about 10 tons, fell away from three "slips" at a height of 9 feet. He was killed instantly. Inspection and inquiry made.
56	2nd November, 12-30 P.M.	Jainty Central mine, Karnatar P. O., Bihar and Orissa.	Jainty Central Colliery, Ltd.	Bhatu Roy, (m.), 45, <i>Coal-cutter.</i>	Coal	Deceased went through a fence and commenced picking up fallen coal in a goaf, when a mass of stone, $8' \times 5' \times 1'$ , fell upon him from a height of 6 feet. He was killed instantly. Inspection and inquiry made.
57	2nd November, 7 P.M.	Seetalpur mine, Disergarh P. O., Bengal.	Bengal Coal Co., Ltd.	Hosini Meah, (m.), 40, <i>Timberman.</i>	Coal	Deceased, whilst withdrawing props underground, was pinned to the floor by falling props and stone. He sustained injuries from which he died twelve hours later. Inspection and inquiry made.
58	23rd November, 12-10 P.M.	Pootkee mine, Kusunda P. O., Bihar and Orissa.	Eastern Coal Co., Ltd.	Nanda Lal Singh, (m.), 21, <i>Stone-cutter.</i>	Coal	Deceased was sitting at a cross road on a main haulage slope when a mass of stone, $30' \times 30' \times 1'$ , fell from the roof, 6 feet above. He was killed instantly. Inspection and inquiry made.



# APPENDIX II—contd.

## Fatal Accidents, 1923—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Cause of accident and remarks.
59	6th December, 4 A.M.	Alkusa South mine, Kusumda P. O., Bihar and Orissa.	<b>FALLS OF ROOF AND SIDES—contd.</b> (a) Falls of roof—(92 deaths)—contd. Ranegunge Coal Association, Ld.	Nathu Bhakta, (m.), 39, Coal-cutter.	Coal	Whilst engaged in pillar cutting operations, deceased was killed by a block of coal weighing about 1 cwt. which fell on him from a height of 12 feet. Inspection and inquiry made.
60	15th December, 2-30 A.M.	Kajora mine, Andal P. O., Bengal.	Kajora Coal Co., Ld.	Shaheb Chamar, (m.), 36, Coal-cutter.	Coal	Deceased went through a fence and was robbing coal from the side of a pillar, when a mass of overhanging coal, 4' x 2' x 1', fell upon him from a height of 13 feet. He was killed instantly. Inspection and inquiry made.
61	21st December, 6 A.M.	Benahir mine, Jharia P. O., Bihar and Orissa.	Standard Coal Co., Ld.	Srimati Majhian, (f.), 26, Sankar Manjhi, (m.), 7, Labourers. Botel Singh, (m.), 22, Coal-cutter. Nanki Majhian, (f.), 14, Mani Majhian, (f.), 24, Coal-carriers.	Coal	The deceased, who were sitting at the junction of three galleries were killed by a fall of roof stone, 12' x 7' x 9", from a height of 25 feet. Inspection and inquiry made.
62	24th December, 2-30 P.M.	Kankani mine, Bansjora P. O., Bihar and Orissa.	Eastern Coal Co., Ld.	Tekoo Mahaton, (m.), 35, Coal-cutter.	Coal	Deceased left his working place and was loading coal near the edge of a goaf when he was killed instantly by a fall of roof, weighing about 2 tons. Inspection and inquiry made.
63	27th December, 6-30 P.M.	Jharia Khas mine, Jharia P. O., Bihar and Orissa.	Standard Coal Co., Ld.	Jahar Mesh, (m.), 30, Bandhu Chamar, (m.), 32, Bharas Chamar, (m.), 36, Sonai Chamar, (m.), 25, Labourers. Rama Chamar, (m.), 24, Coal-cutter.	Coal	The deceased were killed by a fall of roof coal weighing about 25 tons in a gallery 25 feet high. Inspection and inquiry made.

64	2nd January, 5 P.M.	Kurhuraee mine, Girdih P. O., Bihar and Orissa.	East Indian Railway Co.	(b) Falls of side—(101 deaths). Fatan Roy, (m.), 32, Coal-cutter.	Coal	Deceased was struck by a prop which was knocked down by a piece of coal, 5' x 4' x 2', weighing 30 cwt., which fell from the side, a height of 16 feet. He was killed instantly. Inspection and inquiry made.
65	6th January, 4 A.M.	Burra Golai mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ltd.	Gonch Kole, (m.), 30, Permanent way workman.	Coal	Whilst deceased was engaged in repairing a tramline he was injured by a fall of side coal. He died from his injuries next day. Inspection and inquiry made.
66	18th January, 11-30 P.M.	Joba mine, Kalipahari P. O., Bengal.	Burrakur Coal Co., Ltd.	Hardeogir Gossai, (m.), 35, Coal-cutter.	Coal	Whilst deceased was levering down some overhanging coal, which he had been forbidden to touch, the coal fell upon him, causing injuries from which he died within a few hours. Two other persons were slightly injured. Inspection and inquiry made.
67	20th January, 5-30 P.M.	Durgapur mine, Jharua P. O., Bihar and Orissa.	P. D. Hamir & Co.	Manvati Gond, (f.), 45, Coal-carrier.	Coal	Whilst engaged in loading coal which had been blasted down in a gallery, deceased was struck by a block of coal, weighing about 1 ton, which fell from a height of 20 feet. Inspection and inquiry made.
68	20th January, 7 P.M.	Pootkee mine, Kusunda P. O., Bihar and Orissa.	Eastern Coal Co., Ltd.	Doman Rowani, (m.), 26, Coal-cutter.	Coal	Deceased was loading coal in a gallery when a piece of overhanging coal, weighing about 15 cwt., fell, killing him instantly. Inspection and inquiry made.
69	25th January, 8-30 A.M.	Mahakali mine, Chanda P. O., Central Provinces.	Hajeebhoy Laljee & Co.	Gonda Rama, (m.), 26, Raja Asha, (m.), 26, Pocia Brishnath, (m.), 26, Sadar Pochi, (f.), 13, Puller Kitta, (m.), 13, Anki Ram, (f.), 13, Bhagi Nago, (f.), 14, Lajedharma, (f.), 13, Labourers.	Coal	A gang of persons was engaged in cleaning out a drain running down the centre of a new inclined cutting, the greatest depth of which was 19 feet. A portion of one of the sides suddenly collapsed, and some 3 tons of debris fell upon the deceased. Before they could be extricated they died from suffocation. Seven bodies were got out within two hours, but owing to a further fall of several tons of debris one body was not recovered until about two days later. Inspection and inquiry made.

# APPENDIX II—contd.

## Fatal Accidents, 1923—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Cause of accident and remarks.
<b>FALLS OF ROOF AND SIDES—contd.</b>						
<b>(b) Falls of side—(101 deaths)—contd.</b>						
70	7th February, 5 A.M.	Bagdigi mine, Jharla P.O., Bihar and Orissa.	Villiers, Ltd.	Khabloo Bilaspuri, (m.), 16, Coal-cutter. Bhukhli Bilaspuri, (f.), 14, Coal-carrier.	Coal	The deceased were cutting floor-coal in an underground gallery, when some 4 tons of coal fell from the side, killing them instantly. Inspection and inquiry made.
71	15th February, 8-30 A.M.	New Kessurgurah mine, Navagarh P. O., Bihar and Orissa.	New Kessurgurah Coal Co., Ltd.	Mongal Manjhi, (m.), 20, Coal-cutter.	Coal	Whilst engaged in the extraction of a pillar which had been undercut below a band of stone in the coal seam, deceased was killed by the fall of a slab of this stone, 15"×30"×12", from a height of 8 feet. Inspection and inquiry made.
72	19th February, 1-45 P.M.	Borrea mine, Sitarampur P. O., Bengal.	New Beerbhoom Coal Co., Ltd.	Dhanu Mahaton, (m.), 48, Labourer.	Coal	Whilst deceased was preparing to erect timber in a place where pillar extraction was going on, he was struck by a small piece of coal which fell from a height of 18 feet. He received injuries from which he died four days later. Another person received slight injuries. Inspection and inquiry made.
73	20th February, 10 A.M.	Cherangcode mine, Cheranbadi P. O., Nilgiris, Madras.	A. H. Gaston	Narayanan Nair, (m.), 35, Assistant mistri; Oonnia Kutty K., (m.), 25, Mistri; Kungamu, (m.), 25, Koyamu K., (m.), 32, Oonnia Kutty M., (m.), 25, Idross, (m.), 20, Kungalan, (m.), 22, Labourers.	Mica	Whilst a gang of miners was at work in the bottom of an open cast, one side collapsed and buried ten persons. Seven were killed and one was seriously injured. Inspection and inquiry made.

74	20th February, 5 P.M.	Kurhurbaree mine, Girdih P. O., Bihar and Orissa.	East Indian Railway Co.	Bahadur Meah, (m.), 23, <i>Coal-cutter.</i>	Coal	Deceased was struck by a piece of coal, 10' x 6' x 2', which fell from the side, a height of 8 feet. He received injuries from which he died almost immediately. Inspection and inquiry made.
75	21st February, 11 A.M.	Bharatchak mine, Sunderchak P. O., Bengal.	B. N. Senyal	Menoka Baurin, (f.), 35, <i>Labourer.</i>	Coal	Deceased was killed by a fall of stone from the sides of an open cutting. The place was said to have been fenced-off. Inspection and inquiry made.
76	21st February, 10 P.M.	Alkusa North mine, Kusunda P. O., Bihar and Orissa.	Raneengunge Coal Association, Ltd.	Sukar Santal, (m.), 30, <i>Labourer.</i>	Coal	Deceased, whilst sitting in his working place, was killed by some side coal, about 3 tons, which fell from a height of 15 feet. Inspection and inquiry made.
77	1st March, 12-30 P.M.	Rajhara Bhuyakhad mine, Rajhara P. O., Bihar and Orissa.	Bengal Coal Co., Ltd.	Bhajan Noonin, (m.), 70, <i>Labourer.</i>	Fireclay	Deceased was sitting in a quarry when about 1 cwt. of fireclay fell from the side and struck him on the back, causing fatal injuries. Inspection and inquiry made.
78	1st March, 2-30 P. M.	Jeongora mine, Jharia P. O., Bihar and Orissa.	East Bararee Coal Co.	Baharan Bhaina, (m.), 30, <i>Coal-cutter.</i>	Coal	Deceased and another man went through a fence and commenced to cut coal from the side of a pillar which was known to be dangerous. A block of coal, 4'-6" x 3' x 15", fell on them from a height of about 7 feet. Deceased died from his injuries a few hours afterwards and the other man sustained a simple fracture of the right leg. Inspection and inquiry made.
79	7th March, 10 P.M.	Damagurria mine, Kulti P. O., Bengal.	Damagurria Coal Co., Ltd.	Tota Manjhi, (m.), 30, <i>Coal-cutter.</i>	Coal	Deceased undercut the face of a quarry and brought about the fall of a mass of coal, 4'-6" x 4'-6" x 2'-6", from a height of 6 feet. He was killed instantly. Inspection and inquiry made.
80	18th March, 7-30 A.M.	Kirkend mine, Kusunda P. O., Bihar and Orissa.	R. B. Sircar & Sons	Jharna Dosadh, (m.), 20, <i>Coal-cutter.</i>	Coal	Deceased, who was engaged in pillar-cutting, was in the act of loading a basket of coal when a block of coal, about 15 cwt., fell on him from a height of 10 feet, killing him instantly. Inspection and inquiry made.
81	20th March, 12-45 P.M.	Kustore North mine, Kusunda P. O., Bihar and Orissa.	Raneengunge Coal Association, Ltd.	Shanee Roy, (m.), 35, <i>Coal-cutter.</i>	Coal	Deceased passed through a fence and was robbing a pillar when a piece of coal, 8' x 6' x 3' fell from a height of 5 feet, and killed him instantly. Inspection and inquiry made.
82	26th March, 3-30 P.M.	Bonbiddih mine, Samdi P. O., Bengal.	U. N. Mondal	Gobinda Bauri, (m.), 35, Robi Kora, (m.), 28, Kedar Bauri, (m.), 45, Makunda Mali, (m.), 40, <i>Coal-cutters.</i>	Coal	The deceased left their working places in a quarry and went into a fenced-off portion of the quarry to shelter from the sun, when about 7 tons of soft overburden fell upon them from a height of 13 feet. Gobinda and Robi were killed instantly. The other two men were injured and subsequently died. Inspection and inquiry made.
83	4th April, 9-30 A.M.	Chanch mine, Barakati P. O., Bihar and Orissa.	Bengal Coal Co., Ltd.	Ramsahai Manjhi, (m.), 20, <i>Coal-cutter.</i>	Coal	Whilst robbing pillars in a fenced-off area, deceased was killed by a fall of some 3 tons of side coal. Inspection and inquiry made.

# APPENDIX II—contd.

## Fatal Accidents, 1923—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Cause of accident and remarks.
<b>FALLS OF ROOF AND SIDES—contd.</b>						
<b>(b) Falls of side—(101 deaths)—contd.</b>						
84	17th April, 10-30 A.M.	Bawdin mine, Namtu P. O., Northern Shan States, Burma.	Burma Corporation, Ltd.	Fa Ka Chone, (m.), 27, Miner.	Silver-Lead- Zinc.	Deceased was at work in a stope timbered with square sets, and was cutting away some ore in order to make room for lagging, when a mass of ore fell from the side. He sustained serious injuries from which he died a few hours later. Inspection and inquiry made.
85	21st April, 3-30 P.M.	Bhulanbarace mine, Pathardih P. O., Bihar and Orissa.	Bhulanbarace Coal Co., Ltd.	Sunder Rajwar, (m.), 25, Coal-cutter.	Coal	Deceased was sitting down near one side of a narrow quarry when a large fall of overburden took place on the opposite side, and about 2 cwt. of earth fell on him. Death was due to suffocation. His body was not recovered until the following day as rescue work was conducted on the main fall where it was thought deceased had been buried. Inspection and inquiry made.
86	30th April, 11-45 A.M.	Latchipore mine, Sitarampur P. O., Bengal.	Burrakur Coal Co., Ltd.	Doman Bhumji, (m.), 56, Coal-cutter.	Coal	Deceased passed through a fence to rob coal in an underground gallery. About 10 cwt. of coal fell from the side of the gallery and killed him instantly. Inspection and inquiry made.
87	5th May, 7-30 P.M.	Bankola mine, Ukhra P. O., Bengal.	Burrakur Coal Co., Ltd.	Madan Bauri, (m.), 19, Coal-cutter.	Coal	After blasting in an underground gallery, deceased stood under some unsafe coal which fell and killed him. Inspection and inquiry made.
88	8th May, 2 P.M.	Gopalichuck West mine, Kusunda P. O., Bihar and Orissa.	Gopalichuck Coal Co., Ltd.	Bander Noonnia, (m.), 35, Coal-cutter.	Coal	Deceased left his appointed working place and began to cut coal from the side of a pillar. A mass of coal, weighing about 5 cwt., fell upon him from a "slip" at a height of 10 feet, causing injuries from which he died seventeen hours later. Inspection and inquiry made.
89	23th May, 2-30 P.M.	Serampur mine, Girdih P. O., Bihar and Orissa.	East Indian Railway Co.	Hemia Jolhin, (f.), 35, Coal-carrier.	Coal	Deceased, whilst loading coal robbed by miners from the corner of a pillar, was killed by a fall of overhanging coal. Inspection and inquiry made.
90	8th June, 3 P.M.	Bhowra mine, Jamadoba P. O., Bihar and Orissa.	Eastern Coal Co., Ltd.	Lila Bauri, (m.), 26, Coal-cutter; Sani Baurin, (f.), 16, Coal-carrier.	Coal	The deceased were cutting floor coal in a gallery, when a mass of coal 16' x 13' x 2' fell from the side. Lila was killed instantly, and Sani died four hours later. Inspection and inquiry made.

91	9th June, 1-45 P.M.	Budroochuck mine, Sijua P. O., Bihar and Orissa.	Budroochuck Coal Mining Co., Ld.	Rana Bhattacharjee, (m.), 25, Coal-cutter.	Coal	Deceased was dressing down some side coal after blasting, when a mass of coal, weighing about 8 cwt., fell upon him from a height of 10 feet. He was killed instantly. Inspection and inquiry made.
92	13th June, 5-30 A.M.	Joba mine, Kalipahari P. O., Bengal.	Burrakur Coal Co., Ld.	Mungri Chamar, (f.), 16, Coal-carrier.	Coal	Deceased was loading coal in an underground gallery when about a ton of coal fell from the side she sustained fatal injuries. Another person was seriously injured. Inspection and inquiry made.
93	21st June, 5 P.M.	Dhori mine, Bokarc P. O., Bihar and Orissa.	Bokaro-Ramgur, Ld.	Bansidhari, (m.), 60, Manti, (f.), 50, Phagani, (f.), 35, Labourers; Padma, (m.), 26, Coal-cutter; Bansi, (f.), 19, Pachumia, (f.), 16, Phafi, (f.), 15, Coal-carriers.	Coal	The deceased were cutting floor coal in a quarry, when a mass of coal and overburden, 80' x 39' x 5', fell from a "slip" in the side. They were killed instantly. Inspection and inquiry made.
94	26th June, 7-30 A.M.	Shampore mine, Nirshachati P. O., Bihar and Orissa.	Shampore Coal Co., Ld.	Mukut Ram, (m.), 30, Coal-cutter. Bahura, (f.), 34, Coal-carrier.	Coal	The deceased, against orders, went to work in a dangerous part of a quarry and were killed by a mass of side coal, 18' x 8' x 1'-9", which fell on them. Inspection and inquiry made.
95	28th June, 1 A.M.	Bolompore mine, Raniganj P. O., Bengal.	Bolompore Coal Co., Ld.	Mukunda Bauri, (m.), 32, Coal-cutter.	Coal	Deceased went through a fence and undercut the corner of a pillar causing a mass of coal, 2'-9" x 2'-9" x 2'-6", to fall on him. He received injuries from which he died shortly after. Inspection and inquiry made.
96	1st July, 8-30 A.M.	Kyaukpon mine, Karathuri P. O., Burma.	A. H. Morgan & S. O. Holmes	Hon San, (m.), 35, Overseer.	Tin ore	Deceased was killed by a fall of side in an open cutting.
97	4th July, 11-30 P.M.	Douia (Pansira-Buru) mine, Manharpur P. O., Bihar and Orissa.	Bengal Iron Co., Ld.	Chandmoni, (f.), 17, Labourer; Popat Lal, (m.), 35, Chargeman.	Iron ore	The deceased and several other persons passed through a fence in a quarry and were picking up ore in a prohibited area, when a fall of about 50 tons of soft ore and overburden took place. The deceased were completely buried and their bodies were not recovered until ten hours later. Inspection and inquiry made.

# APPENDIX II—contd.

## Fatal Accidents, 1923—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Cause of accident and remarks.
<b>FALLS OF ROOF AND SIDES—contd.</b>						
<i>(b) Falls of side—(101 deaths)—contd.</i>						
98	13th July, 9-30 A.M.	Kanbauk mine, Tavoy P. O., Burma.	Kanbauk (Burma) Wolfram Mines, Ltd.	Gin Lone, (m.), 28, <i>Mining Tributer.</i>	Tin and Wol- fram ores	Deceased was killed by a fall of side in an open excavation.
99	14th July, 8-30 A.M.	Sitasaongi mine, Dongri P. O., Bhaudara, Central Provinces.	Central Provinces Prospect- ing Syndicate, Ltd.	Musamat Jakho, (f.), 18, <i>Labourer.</i>	Manganese ore	Deceased, whilst engaged in loading rock in a cutting, was fatally crushed by a falling mass of rock. The rock measured 2'×2'— 6"×1'—6", and fell a distance of 18 inches only.
100	24th July, 1 P.M.	Bankola mine, Utkhra P. O., Bengal.	Burrakur Coal Co., Ltd.	Baldeo Sinha, (m.), 37, <i>Coal-cutter.</i>	Coal	After blasting down coal in an underground gallery deceased returned to the place before the smoke had cleared. A large block of coal fell and killed him. Inspection and inquiry made.
101	23th July, 3 P.M.	Viceroy mine, Nandi P. O., Bengal.	Minto Coal Co., Ltd.	Jitoo Manjhi, (m.), 28, <i>Coal-cutter.</i>	Coal	Whilst deceased was extracting a "stook" of coal the "stook" or collapsed. He failed to get clear and received injuries from which he died shortly after. Inspection and inquiry made.
102	26th July, 1 P.M.	Ledo Valley mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ltd.	Nikaram Jaisi, (m.), 28, <i>Labourer.</i>	Coal	Deceased was loading coal near the entrance of an "opening" or chamber when a mass coal, weighing about 10 cwt., fell upon him from a "slip" at a height of 15 feet. He was killed instantly. Inspection and inquiry made.
103	21st August, 4 P.M.	Namdang mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ltd.	Subhagon Chamar, (m.), 32, <i>Coal-cutter.</i>	Coal	Deceased, whilst cutting coal in a quarry, was struck by a fall of overburden, weighing about 4 cwt. He was killed instantly. Inspection and inquiry made.
104	22nd August, 10-30 A.M.	Chowrasie mine, Disergarh P. O., Bihar and Orissa.	Equitable Coal Co., Ltd.	Maku Bauri, (m.), 40, <i>Coal-cutter.</i>	Coal	Whilst deceased was working on a pillar which was almost extract- ed, some roof coal in the goaf fell, causing the remaining rib of the pillar to collapse. Deceased was severely injured and died shortly afterwards. Inspection and inquiry made.
105	23rd August, 9-30 A.M.	Hermyingyi mine, Hermyingyi P. O., Burma.	Burma Finance and Mining Co., Ltd.	Chong Tuck, (m.), 50, <i>Labourer.</i>	Tin and Wol- fram ores.	Whilst engaged in sluicing operations on a hillside, deceased was fatally injured by a fall of ground.

106	6th September, 9-30 A.M.	Tetulmuri mine, Sijua P. O., Bihar and Orissa.	Burrakur Coal Co., Ltd.	Parbatia Beldarin, (f.), 23, Labourer.	Coal	Deceased entered a fenced area in a quarry and was struck by a piece of stone, weighing about 10 lb., which fell from the side at a height of 20 feet. Inspection and inquiry made.
107	6th September, 1-30 P.M.	Loyabad mine, Bansjora P. O., Bihar and Orissa.	Burrakur Coal Co., Ltd.	Sitaram Mahaton, (m.), 50, Coal-cutter.	Coal	Deceased and another coal-cutter passed through a fence and were robbing coal from the side of a pillar. A mass of coal, 4'×2'×1', fell upon deceased from a "slip" and killed him instantly. Inspection and inquiry made.
108	7th September, 11-30 A.M.	Sodepur mine, Sunderchak P. O., Bengal.	Bengal Coal Co., Ltd.	Khari Majhian, (f.), 23, Coal-carrier.	Coal	A miner was taking down overhanging coal. Deceased, who was standing too near, was struck by the falling coal and received injuries from which she died a month later. Inspection and inquiry made.
109	10th September, 7-30 A.M.	Karathuri mine, Karathuri P. O., Burma.	Kaington	Ah Tin Na, (m.), 35, Labourer.	Tin ore	Deceased was killed by a fall of side in an open excavation.
110	13th September, 4-30 P. M.	Baramasia mine, Gauwan P. O., Bihar and Orissa.	Bhagwan Das Marwari	Hopna Manjhi, (m.), 28, Labourer.	Mica	Deceased, whilst engaged with others in removing the overburden of an old tunnel, was struck on the head by a piece of rock, 2'×2'×1', which fell from a height of 7 feet and killed him instantly. Inspection and inquiry made.
111	15th September, 4 P.M.	Karathuri mine, Karathuri P. O., Burma.	Ma Me	Hpon Shein, (m.), 38, Labourer.	Tin ore	Deceased was killed by a fall of side in an open excavation.
112	22nd September, 3 A.M.	Kosoonda and Nyadee mine, No. 1 Division, Kusunda P. O., Bihar and Orissa.	Kosoonda and Nyadee Collieries, Ltd.	Bhodi Dosadh, (m.), 35, Coal-cutter.	Coal	Deceased, whilst endeavouring to take down some overhanging side coal, was struck by a piece of coal, 4'×4'×18", which fell from a "slip" at a height of 5 feet. He received fatal injuries. Inspection and inquiry made.
113	23rd September, 7-30 A.M.	Ena mine, Jharia P. O., Bihar and Orissa.	North West Coal Co., Ltd.	Lelua Hazan, (m.), 25, Coal-cutter.	Coal	Deceased passed through a fence and was robbing coal from the corner of a pillar near his working place, when a mass of coal, weighing about 10 cwt., fell upon him from a height of 6 feet. He sustained serious injuries to which he succumbed two hours later. Inspection and inquiry made.
114	26th September, 4-30 A.M.	Chanch mine, Barakar P. O., Bihar and Orissa.	Bengal Coal Co., Ltd.	Fakan Roy, (m.), 30, Shyam Lal Roy, (m.), 22, Coal-cutters.	Coal	Whilst the deceased were robbing coal from the corner of a pillar, they were killed by a mass of some 5 tons of coal which fell from a "cleat" which they had exposed. Inspection and inquiry made.
115	1st October, 1 P.M.	Namdang mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ltd.	Ramsingh Ahir, (m.), 38, Santey Kami, (m.), 29, Trammers.	Coal	The deceased were pushing a loaded tub along a level road, when a fall of some 2 tons of side and roof coal took place and pushed out a setting of timber. They were buried. Santey was killed instantly and Ramsingh sustained serious injuries to which he succumbed an hour later. Inspection and inquiry made.



# APPENDIX II—contd.

## Fatal Accidents, 1923—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Cause of accident and remarks.
<b>FALLS OF ROOF AND SIDES—contd.</b>						
<b>(b) Falls of side—(101 deaths)—contd.</b>						
116	2nd October, 1-30 A.M.	Burra Dhemio mine, Sitarampur P. O., Bengal.	Burra Dhemio Coal Co., Ltd.	Loli Manjhi, (m.), 20, Coal-cutter.	Coal	Whilst deceased was loading coal under some overhanging coal which was being taken down, the overhanging coal collapsed and killed him instantly. Two other persons were seriously injured. Inspection and inquiry made.
117	5th October, 11-30 A.M.	Churulia mine, Panuria P. O., Bengal.	Churulia Coal Co., Ltd.	Duli Muehi, (f.), 13, Labourer.	Coal	The fall of a mass of coal, 7'-6" × 3'-9" × 3'-6", brought about the fall of an iron rail from which a range of pipes was suspended. Deceased, who was passing at the time, was struck by the rail and received fatal injuries. Inspection and inquiry made.
118	7th October, 6 A.M.	Rampur mine, Asansol P. O., Bengal.	A. N. Sircar	Jugal Bauri, (m.), 45, Coal-cutter.	Coal	Deceased went to a fenced-off part of a quarry to cut coal. Some overburden fell upon him, causing injuries from which he died four days later. Inspection and inquiry made.
119	20th October, 2 P.M.	Baraipat mine, Tisri P. O., Bihar and Orissa.	F. F. Chrestien & Co., Ltd.	Tilak Roy, (m.), 17, Miner.	Mica	Deceased, whilst in a seated position and engaged in recovering mica from a dump 6 feet deep, was buried by the fall of side, 5' × 3'-6" × 3', underneath by him. He was suffocated. Inspection and inquiry made.
120	30th October, 10 A.M.	Banastola mine, Jharia P. O., Bihar and Orissa.	New Beerbhoom Coal Co., Ltd.	Firingi Dosadh, (m.), 32, Labourer.	Coal	Deceased was in an underground gallery, on a ladder, attempting to take down some side coal. The coal, against which the ladder was resting, fell, causing the ladder to slip. Deceased fell to the ground and was killed instantly. Inspection and inquiry made.
121	9th November, 4 P.M.	Nand mine, Sindhbari P. O., Punjab.	Sridhar Mehta	Ludar, (m.), 45, Miner.	Slate	Deceased was killed by a fall of side in a quarry.
122	11th November, 5-30 A.M.	Katras mine, Katragarh P. O., Bihar and Orissa.	Burrakur Coal Co., Ltd.	Durpad Chamin, (f.), 35, Coal-carrier.	Coal	Whilst a miner was cutting coal from the side of a pillar, a piece of coal, 6' × 2' × 18", fell from a height of 8 feet, and dislodged a prop. The falling prop struck deceased who received serious injuries and died three months later. Inspection and inquiry made.
123	16th November, 1 A.M.	Fularibad mine, Jharia P. O., Bihar and Orissa.	Fularibad Coal Co., Ltd.	Mukhi Bilaspuri, (m.), 24, Labourer.	Coal	Deceased, against orders, commenced to load coal under the side of a pillar which was being dressed. A mass of coal, weighing about 1½ tons, fell on him from a height of 15 feet, killing him instantly. Inspection and inquiry made.

124	16th November, 2-30 P.M.	Lohara mine, Balaghat P. O., Central Provinces.	Tata Iron & Steel Co., Ltd.	Vaktia, (m.), 60, <i>Miner.</i>	Iron ore	Deceased was killed by a fall of side in quarry.
125	21st November, 5-30 A.M.	Bararee mine, Jamadoba P. O., Bihar and Orissa.	East Indian Coal Co., Ltd.	Gambhir Panika, (m.), 35, <i>Coal-cutter.</i>	Coal	Whilst deceased was standing on a ladder and dressing the side of a pillar of coal, 28 feet in height, a piece of coal, 8'×3'×3', fell against the ladder. He was thrown off and fell to the floor of the gallery where he was struck by some of the falling coal and killed instantly. Inspection and inquiry made.
126	27th November, 4 P.M.	Netra mine, Katangihiri P. O., Central Provinces.	Netra Manganese Co., Ltd.	Makya Mahar, (m.), 28, <i>Labourer.</i>	Manganese ore	Deceased was injured by a fall of side in a quarry. He died subsequently.
127	5th December, 10-30 P.M.	Bhargora mine, Jharua P. O., Bihar and Orissa.	Bhargora Coal Co., Ltd.	Sarda Dom, (f.), 16, <i>Coal-carrier.</i>	Coal	Deceased went inside a fence to load coal, and was struck by a mass of coal, 7'×4'×2', which fell from a "slip" in the side and from a height of 15 feet. She was killed instantly. Inspection and inquiry made.
128	6th December, 3 A.M.	Awadaung mine, Mergui, P. O., Burma.	J. F. Leslie and the Burma Malaya Mines, Ltd.	Ah Kyin, (m.), 40, <i>Tributer.</i>	Tin ore	Deceased was killed by a fall of side in an open cut.
129	7th December, 2 P.M.	Lalki mine, Tisri P. O., Bihar and Orissa.	F. F. Chrestien & Co., Ltd.	Basarat Kalal, (m.), 21, <i>Labourer.</i>	Mica	Deceased was employed in picking out pieces of mica from a waste dump. He under mined the side of a shallow excavation in the dump. The side of this excavation collapsed and buried him. He was suffocated.
130	11th December, 5-6 A.M.	Alkusa North mine, Kusunda P. O., Bihar and Orissa.	Raneunge Coal Association, Ld.	Dookan Meah, (m.), 20, <i>Coal-cutter.</i>	Coal	Deceased, whilst robbing a pillar, was struck by a mass of coal 11'×5'×2', which fell from a "slip" in the corner of the pillar. He was killed instantly. Inspection and inquiry made.
131	12th December, 4 P.M.	Sikardih mine, Giridih P. O., Bihar and Orissa.	Bayra Coal Association	Mungri Musoharin, (f.), 23, <i>Coal-carrier.</i>	Coal	Deceased was killed by the premature fall of a mass of some 3 tons of coal in a working place where a pillar of coal was under extraction. Inspection and inquiry made.
132	17th December, 1-30 P.M.	Kurhbarree mine, Giridih P. O., Bihar and Orissa.	East Indian Railway Co.	Lakhia Dosadhin, (f.), 20, <i>Coal-carrier.</i>	Coal	For the purpose of stealing coal deceased trespassed beyond a fence in a quarry and was struck by coal falling from the side. She died three months later.
133	21st December, 7-30 P.M.	Bhulanbarree mine, Pathardih P. O., Bihar and Orissa.	Bhulanbarree Coal Co., Ltd.	Gouri Mahaton, (m.), 40, Ram Lal Mahaton, (m.), 35, <i>Coal-cutters.</i>	Coal	The deceased were killed by a fall of about 10 tons of coal from the side of a pillar. Inspection and inquiry made.
134	28th December, 11-45 P.M.	Bagdigi mine, Jharua P. O., Bihar and Orissa.	Villiers, Ltd.	Ghamandi Damuk, (m.), 30, <i>Coal-carrier.</i>	Coal	Deceased was killed instantly by a fall of coal, weighing about 4 tons, from the side of a pillar in a seam 27 feet high. Inspection and inquiry made.
135	29th December, 1 A.M.	Bararee mine, Jamadoba P. O., Bihar and Orissa.	East Indian Coal Co., Ltd.	Dhojua Rohidas, (m.), 32, <i>Coal-cutter.</i>	Coal	Deceased passed through a fence and was robbing the corner of a pillar of coal in a seam 25 feet high when a mass of coal, weighing about 10 tons, fell on him killing him instantly. Inspection and inquiry made.

# APPENDIX II—contd.

## Fatal Accidents, 1923—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Cause of accident and remarks.
IN SHAFTS—(32 deaths).						
In shafts—Whilst ascending or descending by machinery—(12 deaths).						
136	1st February, 1 P.M.	Rampur mine, Jharsuguda P. O., Bihar and Orissa.	Hingir-Rampur Coal Co., Ltd.	Dhundi Kisan, (m.), 32, <i>Signalman</i> ; Baleswar Kulka, (m.), 22, <i>Fitter</i> .	Coal	The deceased were being raised in a bucket in a shaft 335 feet deep. When 35 feet from the bottom of the shaft, the bucket caught a supporting clamp near the side of the shaft and was detached from the spring hook. The bucket fell to the bottom of the shaft and the deceased were killed. Inspection and inquiry made.
137	19th February, 2-50 A.M.	Bawdwin mine, Namtu P. O., Northern Shan States, Burma.	Burma Corporation, Ltd.	Tai Yee Nyain, (m.), —, Ywang Chin, (m.), 22, Yan Shao, (m.), —, Bhani Singh, (m.), —, Wang Sai Shin, (m.), —, Ling, Yoo, (m.), —, <i>Miners</i> .	Silver-Lead —Zinc	Whilst seven persons were being lowered in a shaft, a bolt on the friction clutch of the winding drum broke, causing the cage to fall away. The brake was applied, but failed to stop the cage, which crashed on the landing beams. Of the seven persons in the cage six died of injuries received and the other was severely injured. Inspection and inquiry made.
138	23rd March, 12 A.M.	Central Kurkend mine, Kusunda P. O., Bihar and Orissa.	Central Kurkend Coal Co., Ltd.	Tarak Nath Sircar, (m.), 18, <i>Electrical Wireman</i> .	Coal	Deceased and three others boarded a sinking bucket at a mid-inset in a shaft which contained water up to a point about 40 feet below the inset. The bucket instead of being raised in compliance with signals given was lowered into the water. Deceased was drowned but the other three persons contrived to get clear of the bucket and swam in the water till they were rescued. Inspection and inquiry made.
139	14th July, 9-30 P.M.	Nandi mine, Nandi P. O., Bengal.	Nandi Coal Association	Jani Majhian, (f.), 14, <i>Labourer</i> .	Coal	Deceased, with three other persons, was in a cage descending a shaft, 150 feet deep, when the spur-wheel of the winding engine broke causing the cage to be jerked violently. Deceased fell out of the cage to the bottom of the shaft and was killed instantly. Inspection and inquiry made.

140	25th August, 2-20 A.M.†	Bawdwin mine, Nanttu P. O., Northern Shan States, Burma.	Burma Corporation, Ltd.	Chu Cho Than, (m.), 33, Tramner.	Silver-Lead- Zinc.	Deceased, in attempting to step from a bucket to the edge of a winze, missed his footing and fell to the next level 130 feet below. He was killed instantly. Inspection and inquiry made.
141	27th August, 3-50 A.M.†	Bawdwin mine, Nanttu P. O., Northern Shan States, Burma.	Burma Corporation, Ltd.	Moti Lall, (m.), 22, Tool Nipper.	Silver-Lead- Zinc.	Deceased and another man were engaged in raising steel drills in a cage when three other men, in defiance of standing orders, entered the cage. The cage being overcrowded, deceased got pushed out and was crushed between the cage and the timbering of the shaft, being killed instantly. Inspection and inquiry made.
142	24th April, 6 A.M.	Mosaboni mine, Rakha Mines P. O., Bihar and Orissa.	Cordoba Copper Co. Ltd.	Noah, (f.), 16, Labourer.	Copper ore	Deceased was lying on the landing platform of a sinking well, 48 feet deep. She was suddenly startled and fell to the bottom of the well. She sustained serious injuries to which she succumbed two hours later. Inspection and inquiry made.
143	25th April, 7-10 P.M.	Jheterbad mine, Ukhra P. O., Bengal.	Sir Nirkatan Sircar	Upendra Bauri, (m.), 35, Coal-cutter.	Coal	Deceased was being raised in a shallow shaft. Instead of waiting for the tub to be lowered on to the landing trolley, he jumped off and, missing his footing, fell to the bottom of the shaft. He was killed instantly. Inspection and inquiry made.
144	4th June, 9 A.M.	Shampore mine, Nirshachati P. O., Bihar and Orissa.	Shampore Coal Co., Ltd.	Chiraglin, (m.), 28, Labourer.	Coal	Deceased, while standing on a sinking trolley at the top of a shaft 113 feet deep, slipped and fell down the shaft, being killed instantly. Inspection and inquiry made.
145	19th November, 8 P.M.	Pretoria mine, Charanpur P. O., Bengal.	Seehpore Coal Co., Ltd.	Boson Singh, (m.), 22, Labourer.	Coal	A guide rope was being lowered in a shaft, 316 feet deep. The rope had been lowered 300 feet when it caught on the side of the shaft. Deceased was standing on a buntion across the top of the shaft trying to release the rope when it suddenly became free and pulled him into the shaft. He fell to the bottom of the shaft and was killed instantly. Inspection and inquiry made.
146	9th January, 11-30 A.M.	Mosaboni mine, Rakha Mines, P. O., Bihar and Orissa.	Cordoba Copper Co., Ltd.	Kannar Palany, (m.), 35,‡ Labourer.	Copper ore	Deceased fell from an inset in a shaft into the sump 87 feet below. He was killed instantly. Inspection and inquiry made.
147	20th January, 9 A.M.	Victoria mine, Kulti P. O., Bengal.	New Beerbhoom Coal Co., Ltd.	Debi Singh, (m.), 40, Jemadar.	Coal	While preparing to ascend from the foot of a shaft, which was in course of being fitted up, the deceased fell into the shaft sump, 30 feet deep, and was killed. Inspection and inquiry made.
148	7th March, Unknown.	Mahrauli mine, Mahrauli P. O., Delhi.	Hari Krishan & Brothers	Badlu, (m.), 40, Labourer.	Clay	Deceased was being raised in a shaft, 45 feet deep, by means of a rope and iron hook in which his foot rested. He slipped and fell 30 feet to the bottom of the shaft, and was killed.

## (b) In shafts—Falling into the shaft from the surface—(4 deaths).

## (c) In shafts—Falling from part of the way down—(10 deaths).

Fatal Accidents, 1923—*contd.*

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Cause of accident and remarks.
IN SHAFTS—(32 deaths)— <i>contd.</i>						
(c) In shafts—Falling from part of the way down—(10 deaths)— <i>contd.</i>						
149	22nd May, 9-30 A.M.	North Lakurka mine, Katrasgarh P. O., Bihar and Orissa.	R. C. Guha & Co.	Mukunda Bauri, (m.), 22, <i>Sinker.</i>	Coal	Whilst climbing the winding rope in a sinking shaft, 38 feet deep, deceased lost his grip and fell to the bottom. He succumbed to his injuries shortly after. Inspection and inquiry made.
150	27th May, 6 P.M.	Balaghat mine, Bharweli P. O., Central Provinces.	Central Provinces Prospecting Syndicate, Ltd.	Sahu Lodhi, (m.), 14, <i>Labourer.</i>	Manganese ore.	Deceased fell down a ladderway in a shaft and was killed. Inspection and inquiry made.
151	16th September, 8 A.M.	West Tetturiya mine, Katrasgarh P. O., Bihar and Orissa.	West Tetturiya Collieries, Ltd.	Lukhri Bhuiya, (m.), 30, <i>Trolleyman.</i>	Coal	Whilst deceased was being lowered in a shaft, 174 feet deep, he fell from the cage and was killed instantly. Inspection and inquiry made.
152	25th September, 3-30 P.M.	North Kujama mine, Jharie P. O., Bihar and Orissa.	Gangji Dossa & Sons	Devi Kamin, (f.), 18, <i>Labourer.</i>	Coal	Whilst deceased and five other women were descending a shaft, some object (presumably some bolts and nuts) fell from the surface, and, striking the top of the cage, caused the occupants to become alarmed. In the confusion deceased fell from the cage into the sump. She was found drowned shortly afterwards. Inspection and inquiry made.
153	26th September, 8-30 A.M.	Mosaboni mine, Rakha Mines P. O., Bihar and Orissa.	Cordoba Copper Co., Ltd.	Shaik Panchoo, (m.), 30, <i>Belman.</i>	Copper ore	Deceased fell into the sump at the bottom of a shaft, and was drowned. Inspection and inquiry made.
154	16th November, 5 P.M.	Lakurka mine, Katrasgarh P. O., Bihar and Orissa.	Lakurka Coal Co., Ltd.	Isra Turi, (m.), 25, <i>Signalman.</i>	Coal	Whilst the covering of a shaft at a landing was partially open for repairs, deceased attempted to cross the shaft. He slipped and fell to the shaft bottom 50 feet below. He received fatal injuries. Inspection and inquiry made.

155	25th November, 9-30 A.M.	Mosaboni mine, Rakha Mines P. O., Bihar and Orissa.	Cordoba Copper Co., Ltd.	Munsiamani, (m.), 28, Labourer.	Copper ore	Deceased was climbing up the ladders in a shaft and when he was near the surface a pipe, 6 feet long and 4 inches in diameter, supported at the shaft top, became disconnected and fell on him. He fell to the bottom of the shaft, 180 feet deep, and was killed instantly. Inspection and inquiry made.
156	10th December, 6 A.M.	Khas Sitalpur mine, Chora P. O., Bengal.	Khas Sitalpur Colliery Co.	Abjal Saha, (m.), 40, Stone-cutter.	Coal	When a bucket was being raised from the landing trolley at the top of a sinking shaft, 75 feet deep, it struck the fence at the end of the trolley. The fence was broken and part of it fell down the shaft. Deceased was struck on the head and died from his injuries fifteen hours later. Inspection and inquiry made.
157	26th May, 12-30 P.M.	Tistra mine, Jharua P. O., Orissa, Bihar and Orissa.	Diamond Coal Co.	Jadu Gorai, (m.), 25, Sinker.	Coal	A plumb bob was being lowered in a sinking shaft, 100 feet deep when the string holding the bob broke. The bob struck deceased upon the head causing serious injuries to which he succumbed within a few days. Inspection and inquiry made.
158	2nd July, 11-30 A.M.	Khas Joyrampur mine, Jharua P. O., Bihar and Orissa.	Khengarji Trikoo & Co.	Kaimuddin, (m.), 25, Labourer.	Coal	Deceased, with two other men, was engaged in cleaning out a shaft sump by means of a bucket. On the bucket being lowered he attempted to push it to the opposite side of the shaft, when it swung back and struck him on the head. He was killed instantly. Inspection and inquiry made.
159	10th July, 7 A.M.	Lodna mine, Jharua P. O., Bihar and Orissa.	Lodna Colliery Co., (1920) Ltd.	Bangalia Musahar, (m.), 14, Door attendant.	Coal	Deceased attempted to cross the bottom of a shaft and was struck by the descending cage. He received injuries from which he died four hours later. Inspection and inquiry made.
160	31st July, 6 A.M.	Dhemo Main mine, Sitarampur P. O., Bengal.	Dhemo Main Colliery, Ltd.	Ashu Hari Punjabi, (m.), 35, Labourer.	Coal	Deceased and another man were working in a shaft fixing the anchor beams which were temporarily attached to a guide rope. This guide rope was attached to a winch by a rope which crossed over a railway siding. The funnel of a locomotive caught this rope and jerked the guide rope causing both men to be thrown into the sump. Deceased was killed. Inspection and inquiry made.
161	3rd September, 5-30 P.M.	Mudidih mine, Sijua P. O., Bihar and Orissa.	Burrakur Coal Co., Ltd.	Gangu Bhar, (m.), 50, Pumpman.	Coal	Deceased was in charge of a pump at the bottom of a shaft. Whilst the cages were in motion he attempted to look into the sump, and was crushed beneath the descending cage. He was killed instantly. Inspection and inquiry made.

# APPENDIX II—contd.

## Fatal Accidents, 1923—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Cause of accident and remarks.
162	13th April, 5-15 P.M.	Chandanetta mine, Parasia P.O., Central Provinces.	Pench Valley Coal Co., Ltd.	Thonvarin Dhimran, (f.), 10, Mahatram Dhimran, (m.), 12, <i>Labourers.</i>	Coal	The two deceased and three others while working in a mine near an area of workings suspected of being on fire were overcome by foul gases. The other three recovered. Inspection and inquiry made.
163	1st May, 11-30 P.M.	Sodepur mine, Sitarampur P. O., Bengal.	Bengal Coal Co., Ltd.	Mr. Dean, (m.), 23, <i>Mining Assistant</i> ; Suk Mongal Singh, (m.), 30, <i>Sirdar</i> ; Moti Bauri, (m.), 18, <i>Pumpman</i> ; Rakhal Bhuya, (m.) 17, Suri Baurin, (f.), 15, Bedanee Baurin, (f.), 12, Koomi Baurin, (f.), 30, Susilla Baurin, (f.), 16, Behari Bauri, (m.), 40, <i>Labourers.</i>	Coal	Whilst the deceased were proceeding to their working places in a mine they were overcome by foul gas generated by an underground fire. Inspection and inquiry made.
164	5th June, 4 P.M.	Tikak mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ltd.	Shiray Larki, (m.), 30, <i>Opening man.</i>	Coal	With the object of recovering some tools deceased broke down a stopping and entered a disused working. He was asphyxiated by foul gas. Inspection and inquiry made.
165	27th March, 6-30 P.M.	Asakuti mine, Katrasgarh P. O., Bihar and Orissa.	Royal Coal Co., Ltd.	<b>EXPLOSIVES—(11 deaths).</b> Lochmon Gowala, (m.), 24, <i>Shot-firer.</i>	Coal	Deceased charged and lighted two shots, one of which hung fire. Instead of waiting for the prescribed time he returned to the place almost at once and was killed by the explosion of the shot. Inspection and inquiry made.

166	25th May, 1-30 P.M.	Kendra mine, Pandaveswar P. O., Bengal.	Samla Kendra Collieries, Ltd.	Jogeswar Chamar, (m.), 24, Labourer.	Coal	Deceased lit the fuse of a charged shot-hole, and apparently went back before it exploded. He received injuries from which he died a few hours later. Inspection and inquiry made.
167	30th May, 2-30 P.M.	Central Kurkend mine, Kusunda P. O., Bihar and Orissa.	Central Kurkend Coal Co., Ltd.	Janki Gope, (m.), 25, Dahn Mullick, (m.), 45, Stone-cutters.	Coal	In the shot-firer's absence a box containing gunpowder cartridges was opened and the cartridges ignited by some means. The deceased were burnt and subsequently died. Another man was seriously injured. Inspection and inquiry made.
168	21st June, 12 P.M.	Tisra mine, Jharla P. O., Bihar and Orissa.	Alliance Colliery Co.	Purna Kamin, (f.), 35, Coal-carrier.	Coal	Deceased went unobserved near to a quarry in which blasting was being done, and was struck on the head by a projected piece of stone, weighing about 5 lb. She was killed instantly. Inspection and inquiry made.
169	28th September, 6-30 P.M.	Lodna mine, Jharla P. O., Bihar and Orissa.	Lodna Colliery Co., (1920) Ltd.	Ranchand Teli, (m.), 36, Coal-cutter.	Coal	Deceased, thinking that a shot had misfired, returned to the place when the charge exploded. He sustained serious injuries to which he succumbed eight days later. Inspection and inquiry made.
170	8th October, 2 P.M.	Kandri mine, Kandri P. O., Central Provinces.	Central Provinces Prospecting Syndicate, Ltd.	Baradi, (m.), 16, Labourer.	Manganese ore	Deceased drilled into a charge of gelignite causing it to explode. He sustained an injury to the hand and died from tetanus a week later.
171	23rd October, 6-30 P.M.	Fularibad mine, Jharla P. O., Bihar and Orissa.	Fularibad Coal Co., Ltd.	Gokul Bilaspuri, (m.), 35, Coal-cutter.	Coal	Deceased was assisting to make gunpowder cartridges. He threw a little of the loose powder on to a lamp, and the bulk of the powder became ignited. He was severely burnt and subsequently died. Inspection and inquiry made.
172	11th November, 10 A.M.	Lakurka mine, Katrasgarh P. O., Bihar and Orissa.	Lakurka Coal Co., Ltd.	Kripa Rohida s, (m.), 30, Labourer.	Coal	Whilst deceased was carrying a tin of loose gunpowder a cigarette which he was smoking fell among the powder and ignited it. He sustained burns from which he died fourteen hours later. Inspection and inquiry made.
173	19th November, 11 P.M.	South Kustore mine, Kusunda P. O., Bihar and Orissa.	Ranceeunge Coal Association, Ltd.	Khedan Hazan, (m.), 28, Khemam Hazan, (m.), 27, Stone-cutters.	Coal	The deceased remained too long in the vicinity of a round of shots which they had been lighting. They were killed by the discharge. Inspection and inquiry made.
HAULAGE—(29 deaths).						
174	19th January, 8-15 P.M.	Lodna mine, Jharla P. O., Bihar and Orissa.	Lodna Colliery Co., (1920) Ltd.	Ishwari Panday, (m.), 40, Pumpman.	Coal	Deceased was struck by a runaway tub on an underground haulage plane and received injuries from which he died. Inspection and inquiry made.
175	24th January, 8 P.M.	Khost mine, Khost P. O., Baluchistan.	North Western Railway	Shahdad, (m.), 35, Bellman.	Coal	Deceased, after giving the signal to raise the train, attempted to get into the train. He was crushed between the tubs and the timbering, and fatally injured. Inspection and inquiry made.



# APPENDIX II—contd.

## Fatal Accidents, 1923—contd.

Serial Number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Cause of accident and remarks.
<b>HAULAGE—(29 deaths)—contd.</b>						
176	14th February, 1 A.M.	Kendra mine, Pantaveswar P. O., Bengal.	Samla Kendra Collieries, Ld.	Mongal Kole, (m.), 38, Coal-cutter.	Coal	An empty tub had been uncoupled on a haulage slope at a landing. Owing to a misunderstanding the points had been wrongly set, and the tub ran wild down the incline, a distance of two hundred feet, to where deceased was sitting. He received injuries from which he died shortly after. Inspection and inquiry made.
177	7th February, 8-30 P.M.	Deoli mine, Disergarh P. O., Bihar and Orissa.	Deoli Coal Co., Ld.	Damin Baurin, (f.), 13, Loader.	Coal	Deceased whilst sitting near a fire by the side of a surface haulage road, was knocked down by a train of tubs. She received injuries from which she died four days later. Inspection and inquiry made.
178	1st March, 7-30 P.M.	Budroochuck mine, Sijua P. O., Bihar and Orissa.	Budroochuck Coal Mining Co., Ld.	Bhikhani Rajwarin, (f.), 46, Loader.	Coal	Deceased, who was standing at one side of the foot of a self-acting jig when an empty tub broke away on the incline, instead of staying where she was, attempted to cross the foot of the jig to get to the other side, and was struck by the tub and killed. Inspection and inquiry made.
179	18th March, 1 A.M.	Choitodih mine, Katrasgarh P. O., Bihar and Orissa.	Burrakar Coal Co., Ld.	Latoo Ram Kahar, (m.), 21, Signalman.	Coal	Deceased was sitting at an intermediate crosscut on a main dip haulage when four empty tubs became uncoupled from a set of eight. The tubs knocked out a prop to which the signal wire was attached and the prop struck deceased on the head with such force that he was killed instantly. Inspection and inquiry made.
180	7th April, 4-30 P.M.	Bansra mine, Raniganj P. O., Bengal	Presidency Coal Co	Norendra Nath Roy, (m.), 23, Signalman.	Coal	Whilst a train of three loaded tubs was being hauled up an incline the two rear tubs became uncoupled, ran wild down the incline and struck deceased. He received injuries which proved fatal. Inspection and inquiry made.
181	18th April, 8-10 A.M.	Lodna mine, Jharua P. O., Bihar and Orissa.	Lodna Colliery Co., (1920) Ld.	Punia Chamin, (f.), 23, Coal-carrier.	Coal	Deceased, with three other persons, in spite of being warned not to do so, was sitting at the corner of a level. A train of empty tubs was being lowered down an incline, when the front tub became detached from the rest of the train, ran wild, and was derailed at the level where deceased was sitting. She was struck by the tub and killed instantly. Inspection and inquiry made.
192	21st April, 7 A.M.	Aldih mine, Sitarampur P. O., Bengal.	Aldih Coal Co., Ld.	Sida Manjhi, (m.), 32, Sindar.	Coal	Whilst a set of loaded tubs was being hauled up an incline, the haulage rope slipped off the pulleys at a curve. The rope caught the deceased on the leg and caused injuries which necessitated amputation. He died twelve hours later. Inspection and inquiry made.

183	28th April, 2-30 P.M.	Damagurria mine, Kulti P. O., Bengal.	Damagurria Coal Co., Ltd.	Kadu Baurin, (f.), 10, <i>Labourer.</i>	Coal	Deceased put her leg through a small opening in the fencing of the return wheel of an endless rope haulage. She sustained injuries which caused death five days later. Inspection and inquiry made.
184	28th April, 5 P.M.	Katras mine, Katrasgarh P. O., Bihar and Orissa.	Burrakur Coal Co., Ltd.	Rasul Turi, (m.), 15, <i>Engine-cleaner.</i>	Coal	A train of sixteen tubs was being hauled up an incline. There should have been no more than ten tubs on the train and, due to the excessive load, the electric switch at the motor was "cut-out." The engineman was unable to control the load with the brake and the train ran back and demolished the stop block at the bottom of the incline. Deceased, who was sitting just below the stop block, was struck by the tubs and killed. Inspection and inquiry made.
185	23rd May, 10 A.M.	Dishergarh mine, Dishergarh P. O., Bengal.	Equitable Coal Co., Ltd.	Sambha Manjhi, (m.), 18, <i>Coal-cutter.</i>	Coal	Whilst a loaded train of tubs was being hauled up an incline a draw-bar broke and the last four tubs ran back, left the rails, and crushed the deceased against the corner of a pillar. Inspection and inquiry made.
186	23rd May, 8-30 P.M.	Malkora mine, Katrasgarh P. O., Bihar and Orissa.	Tata Iron & Steel Co., Ltd.	Damini Hari, (f.), 15, <i>Coal-carrier.</i>	Coal	Deceased was knocked down by a loaded tub which was gravitating towards the bottom of a shaft. She received injuries from which she died four days later. Inspection and inquiry made.
187	27th June, 6-30 P.M.	Loyabad mine, Bansjora P. O., Bihar and Orissa.	Burrakur Coal Co., Ltd.	Ram Prasad Dhobi, (m.), 25, <i>Lookman.</i>	Coal	Whilst deceased was walking up a steep haulage slope a train of loaded tubs became derailed. He was crushed between the tubs and the side of the road, and sustained fatal injuries. Inspection and inquiry made.
188	5th July, 7-45 A.M.	Kendwadiah mine, Kusunda P. O., Bihar and Orissa.	East Indian Coal Co., Ltd.	Roghbar Koiree, (m.), 18, <i>Trolleyman.</i>	Coal	A tub was being loaded on a grade of 1 in 30. The wheels were not spragged and the tub ran forward crushing deceased between it and the other loaded tubs. He was killed instantly. Inspection and inquiry made.
189	2nd August, 4-30 P.M.	Tisra mine, Jharra P. O., Bihar and Orissa.	Diamond Coal Co.	Garula Rohidas, (f.), 35, <i>Coal-carrier.</i>	Coal	Deceased, whilst walking on a haulage incline, was killed by a train of empty tubs which ran wild owing to the breaking of a draw-bar. Inspection and inquiry made.
190	8th August, 7-30 A.M.	Mohpani mine, Mohpani P. O., Central Provinces.	Great Indian Peninsula Railway Co.	Jankia Ahiran, (f.), 45, <i>Coal-carrier.</i>	Coal	Whilst standing on a haulage landing, deceased was knocked down by an incoming train. She received injuries from which she died four days later. Inspection and inquiry made.
191	9th August, 1 P.M.	Serampur mine, Girdih P. O., Bihar and Orissa.	East Indian Railway Co.	Mani Dosadh, (m.), 32, <i>Trolleyman.</i>	Coal	Deceased was re-railing a tub on an endless rope haulage road. The rope started to move, and he was crushed between the tub and the side of the road. He died two days later. Inspection and inquiry made.
192	14th September, 1 P.M.	Bagdigi mine, Jharra P. O., Bihar and Orissa.	Villiers, Ltd.	Kusum, (f.), 40, <i>Coal-carrier.</i>	Coal	A train of eight tubs was standing against a temporary stone buffer on a road with an inclination of 1 in 9. Deceased was standing between two tubs loading coal when the train ran a few feet over the buffer. One of the tubs became derailed, turned over on to the deceased and killed her instantly. Inspection and inquiry made.

# APPENDIX II—contd.

## Fatal Accidents, 1923—contd.

Serial Number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Cause of accident and remarks.
<b>HAULAGE—(29 deaths)—contd.</b>						
193	19th September, 10-30 A.M.	Bawdwin mine, Nanttu P. O., Northern Shan States, Burma.	Burma Corporation, Ltd.	Young Quai, (m.), 25, <i>Trammer.</i>	Silver-Lead- Zinc	Deceased was crushed between an ore truck and the corner of a chute. He received injuries from which he died on the following day. Inspection and inquiry made.
194	29th September, 9-30 P.M.	Choitodih mine, Katragarh P. O., Bihar and Orissa.	Tata Iron & Steel Co., Ltd.	Mahadeo, (m.), 32, <i>Trolleyman.</i>	Coal	Deceased, whilst riding in front of a train of tubs, dropped his lamp, and, in trying to recover it, fell off. He received injuries from which he died on the following day. Inspection and inquiry made.
195	7th October, 5 A.M.	Damudapur mine, Nandi P. O., Bengal.	Bengal Coal Co. Ltd.	Sambhu Bauri, (m.), 25, <i>Trammer.</i>	Coal	Deceased was knocked down by a runaway tub on an underground haulage plane. He sustained injuries from which he died twenty-four hours later. Inspection and inquiry made.
196	20th October, 11-30 A.M.	Glugus mine, Ballarpur P. O., Central Provinces.	Sir K. C. Daga & Bros. and Hon'ble Sir M. B. Dada- bhoj.	Balliga, (m.), 30, <i>Platenman.</i>	Coal	Deceased was crushed between the side of a pillar of coal and a train of eight tubs which had run wild. He was killed. Inspection and inquiry made.
197	19th November, 12-30 P.M.	Daudot mine, Dandot P. O., Punjab.	Thakur Das and Ramji Das	Gulab, (m.), 25, <i>Coal-cutter.</i>	Coal	Deceased was pulling a tub on a tram line in a narrow underground road. On coming to a down grade he lost control of the tub and was crushed between it and the side of the road. He received injuries from which he died two days later. Inspection and inquiry made.
198	20th November, 11 A.M.	Khowra mine, Khowra P. O., Punjab.	Government of India	Ghulam Mahomed, (m.), 33, <i>Miner.</i>	Salt	Deceased was run over on an underground haulage road. His leg was injured and he died two months later.
199	19th December, 11 A.M.	Saltoze mine, Disergarh P. O., Bihar and Orissa.	Burrakur Coal Co., Ltd.	Karbni Bauri, (m.), 33, <i>Trolleyman.</i>	Coal	Deceased was standing behind a train of four loaded tubs on a slightly inclined road, when another loaded tub ran away from inbye and crushed him against the tubs. He was killed instantly. Inspection and inquiry made.
200	20th December, 2 A.M.	Tirap mine, Margherita P. O., Assam.	Assam Railways & Trading Co., Ltd.	Balla-Teli, (m.), 32, <i>Trolleyman.</i>	Coal	Deceased was lying asleep by the side of a tramming road when a full tub passed over his thumb and crushed it. Gangrene set in and he died nine days later. Inspection and inquiry made.

201	26th December, 3-45 p.m.	Namdang mine, Margherita P. O., Assam.	Assam Railways & Trading Co., Ltd.	Monbir Lama, (m.), 24, Signalman.	Coal	Deceased failed to attach an empty tub to the rope at the bottom of a short self-acting incline with a gradient of 1 in 2½. The full tub ran wild into the empty tub, and deceased, whilst attempting to get clear, was crushed between the empty tub and the side of the road. He sustained serious injuries to which he succumbed a few minutes later. Inspection and inquiry made.
202	28th December, 4 p.m.	Bawdwin mine, Nanttu P. O., Northern Shan States, Burma.	Burma Corporation, Ltd.	Man Bahadur, (m.), 43, Mucker.	Silver-Lead- Zinc	Deceased was crushed between a loaded ore car and the timbering of an underground road.
203	8th December, 10-30 p.m.	Purushotampur mine, Pandaveswar P. O., Bengal.	Tata Iron & Steel Co., Ltd.	<b>UNDERGROUND MACHINERY—(2 deaths).</b> Lazarus, (m.), 39, Coal-cutting Machine- man.		Whilst deceased was holding the anchor prop of a chain coal-cutting machine, the prop slipped. The picks caught his leg drawing it in below the machine. He died from his injuries shortly after. Inspection and inquiry made.
204	19th December, 9-30 a.m.	Serampur mine, Girdih P. O., Bihar and Orissa.	East Indian Railway Co.	Gafur Meah, (m.), 14, Oiler.	Coal	Deceased was playing with a haulage rope at a point where it passes over a pulley. His fingers were caught between the rope and the pulley with the result that two fingers were cut off. He succumbed to tetanus five days later. Inspection and inquiry made.
205	11th February, 2-30 a.m.	Jharua Khas mine, Jharua P. O., Bihar and Orissa.	Standard Coal Co., Ltd.	<b>SUNDRIES UNDERGROUND—(11 deaths).</b> Janaki Nath Gore, (m.), 30, Coal-cutter.		Deceased was dressing roof coal in an underground gallery, when the ladder slipped and he fell to the ground. He sustained injuries which caused death eleven days later. Inspection and inquiry made.
206	23rd March, 2-30 a.m.	Kustore South mine, Kusunda P. O., Bihar and Orissa.	Raneegunge Coal Association, Ltd.	Radhia, (f.), 28, Coal-carrier.	Coal	Deceased pushed a tub against other standing tubs the wheels of which were not sufficiently spragged. After the impact the tubs ran backwards and the tub which deceased had been pushing passed over her body killing her instantly. Inspection and inquiry made.
207	30th April, 5 p.m.	Mail mine, Chatterpur P. O., Bihar and Orissa.	Durga Prosad Bhagat	Musamat Mohri Kurmin, (f.), 24, Labourer.	Coal	Whilst deceased was carrying a loaded basket out of a quarry she slipped on the pathway and fell to the bottom of the excavation, sustaining fatal injuries.
208	1st May, 9-30 a.m.	Bawdwin mine, Nanttu P. O., Northern Shan States, Burma.	Burma Corporation, Ltd.	Loa Tha, (m.), 40, Miner	Silver-Lead- Zinc	Deceased fell down a chute and sustained injuries from which he died.
209	12th May, 8-45 a.m.	Bawdwin mine, Nanttu P. O., Northern Shan States, Burma.	Burma Corporation, Ltd.	Narichand, (m.), 20, Miner.	Silver-Lead- Zinc	Whilst deceased was engaged in putting up a rise, a fall of ore occurred breaking the staging on which a ladder was resting. When he attempted to descend, the ladder gave way and he fell to the bottom of the rise. He received injuries from which he died a few hours later. Inspection and inquiry made.

# APPENDIX II—contd.

## Fatal Accidents, 1923—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Cause of accidents and remarks.
<b>SUNDRIES UNDERGROUND—(11 deaths)—contd.</b>						
210	18th June, 6-30 P.M.	Chora mine, Chora P. O., Bengal.	Chora Collieries, Ltd.	Jagdew Kumar, (m.), 28, Coal-cutter.	Coal	Whilst deceased was standing on a ladder levering down a mass of roof coal, which had been loosened by blasting, the coal suddenly gave way. He lost his balance and fell from the ladder, a distance of 14 feet. He received injuries from which he died shortly after. Inspection and inquiry made.
211	23rd June, 10 A.M.	Madhudi mine, Mohuda P. O., Bihar and Orissa.	Madhudi Coal Syndicate, Ltd.	Gidhni Deswalin, (f.), 14, Labourer.	Coal	Deceased, whilst going down an incline, fell and her oil-lamp overturned saturating her clothes and setting fire to them. She died of burns two days later. Inspection and inquiry made.
212	26th July, 9-30 A.M.	Pootkee mine, Kusaunda P. O., Bihar and Orissa.	Eastern Coal Co., Ltd.	Chanoo Baperi, (m.), 40½, Coal-cutting Machine-man.	Coal	Deceased, whilst setting points with a crowbar, was knocked down by the power truck of a coal cutting machine. He received injuries from which he died two days later. Inspection and inquiry made.
213	4th August, 3 P.M.	Khas Jherria mine, Jheria P. O., Bihar and Orissa.	Khas Jherria Colliery Co., Ltd.	Durga C. Gossain, (m.), 30½, Clerk.	Coal	Pillars of coal had been extracted and preparations were being made to withdraw the timbers. The roof began to "weight," and the workmen retired to a narrow road, 150 feet distant. The roof collapsed so suddenly as to cause an air blast, and the air attained such a velocity as to knock the men over. Five men were seriously injured and the deceased succumbed to his injuries eight days later. Inspection and inquiry made.
214	17th October, 5 A.M.	Bankola mine, Ukhra P. O., Bengal.	Burrakur Coal Co., Ltd.	Faga Sinha, (m.), 26½, Punjabi Workman.	Coal	Whilst deceased was demolishing a brick wall at the bottom of a shaft, the top portion of the wall fell on him, causing injuries from which he died shortly after. Inspection and inquiry made.
215	13th December, Unknown.	Hermyingyi mine, Hermyingyi P. O., Burma.	Burma Finance & Mining Co., Ltd.	Shew Pak, (m.), 30, Dump-picker.	Tin and Wolfram ores	Deceased fell down a winze and broke his neck. He was employed on the surface and his entrance into the mine was unauthorised.
<b>SURFACE MACHINERY—(1 death).</b>						
216	24th October, 7-30 A.M.	Chanach mine, Barakar P. O., Bihar and Orissa.	Bengal Coal Co., Ltd.	C. P. Cornish, (m.), 17, Watchman.	Coal	Deceased attempted to pass over a winding rope while it was in motion. He was pulled on to the drum and killed almost instantly. Inspection and inquiry made.

SURFACE BOILERS, OR PIPES BURSTING—(1 death).			
217	30th November, 2 A.M.	Kosoonda and Nyadee mine, Kusunda P. O., Bihar and Orissa.	Kosoonda & Nyadee Collieries, Huna Muchi, (m.), 12, Labourer.
ON SURFACE RAILWAYS AND TRAMWAYS BELONGING TO THE MINE—(4 deaths).			
218	6th April, 11-30 A.M.	Maclellan mine, Manharpur P. O., Bihar and Orissa.	Bengal Iron Co., Ltd. Balra Tamaiany, (f.), 50, Labourer.
219	7th April, 6-45 A.M.	Jambad mine, Chora P. O., Bengal.	Jambad Coal Concern, Ltd. Saboo Bavt, (m.), 35, Tramway.
220	13th April, 1 P.M.	Gua mine, Mahudi, P. O., Bihar and Orissa.	Indian Iron & Steel Co., Ltd. Dasso Kole, (m.), 37, Labourer.
221	24th November, 9-30 A.M.	Maclellan mine, Manharpur P. O., Bihar and Orissa.	Bengal Iron Co., Ltd. Basu Naik, (m.), 50, Labourer.
ELECTRICITY—(3 deaths).			
222	26th May, 2 A.M.	Loyabad mine, Bansjora P. O., Bihar and Orissa.	Burrakur Coal Co., Ltd. Meghu Chamar, (m.), 40, Coal-cutter.
223	14th July, 12 noon.	Mudidih mine, Sijua P. O., Bihar and Orissa.	Burrakur Coal Co., Ltd. Lochman Mulliek, (m.), 25, Cook.
224	7th October, 9-15 A.M.	New Tetturya mine, Katrasgarh P. O., Bihar and Orissa.	New Tetturya Coal Co., Ltd. Sukur Turi, (m.), 36, Filter.

A plug in the crown of the fire-box of a boiler blew out, and steam, water and ashes were blown out and deceased was fatally burnt. Inspection and inquiry made.

Deceased, who was deaf, was crossing a surface tramline when she was knocked down by a loaded tram. She sustained serious injuries to which she succumbed a few hours later. Inspection and inquiry made.

Whilst deceased was riding on a tub on a surface tramway, the tub left the rails and fell over an embankment. Deceased sustained a compound fracture of the leg and died fifteen days later in hospital. Inspection and inquiry made.

Deceased attempted to cross a surface haulage incline when the trains were running. He was run over and sustained injuries which proved fatal a week later.

Deceased attempted to get on the platform of a skip after it had started to ascend a steep incline. He fell off and was run over sustaining serious injuries to which he succumbed fourteen days later. Inspection and inquiry made.

Deceased, probably while under the influence of liquor, climbed a tower supporting a 6,600 volt transmission line. He came into contact with the conductors and received a shock of about 3,800 volts causing injuries from which he died two days later. Inspection and inquiry made.

Deceased, apparently for the purpose of getting a bird's nest, climbed a tower supporting a 6,600 volt transmission line. He came into contact with the conductors and received a shock of approximately 3,800 volts causing injuries from which he died two days later. Inspection and inquiry made.

Deceased appears to have operated the wrong switch and so failed to isolate a 550 volt A. C. overhead transmission line upon which he was about to work. Apparently thinking it was safe to do so, he climbed one of the line supports for the purpose of installing insulator guard, and, touching one of the conductors, received a shock to earth of approximately 300 volts. He almost immediately fell a distance of about 25 feet to the ground where he was found dead. Inspection and inquiry made.

# APPENDIX II—contd.

## Fatal Accidents, 1923—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Cause of accidents and remarks.
<b>MISCELLANEOUS ON SURFACE—(13 deaths).</b>						
225	24th January, 8-30 A.M.	Hindubagh mine, Hindubagh P. O., Baluchistan.	Baluchistan Chrome Co., Ltd.	Nasir, (m.), 18, <i>Aerial rope-way, attendant.</i>	Chromite ore	Deceased was employed at the lower end of an aerial ropeway for the transport of bags of ore. He failed to stand clear and was struck by a bag, being killed instantly. Inspection and inquiry made.
226	16th April, 10-30 A.M.	Salem mine, Suramangalem P. O., Madras.	Magnesite Syndicate, Ltd.	Kolondai, (m.), 50, <i>Labourer.</i>	Magnesite	Deceased fell into an excavation and sustained injuries from which he died soon afterwards.
227	21st April, 11 A.M.	Moiria mine, Ukhra P. O., Bengal.	Moiria Collieries, Ltd.	Sheik Arshad, (m.), 27, <i>Mason.</i>	Coal	Whilst the temporary supports were being removed from the arched roof of a cooly barrack, the roof collapsed burying deceased. He died from his injuries three hours later. Inspection and inquiry made.
228	23rd April, 11 A.M.	Hernyingyi mine, Hernyingyi P. O., Burma.	Burma Finance and Mining Co., Ltd.	Maung Mai, (m.), 50, <i>Sawyer</i>	Tin and Wolfram ores	Deceased, who was standing on the gantry of a sawpit, was struck on the legs by a falling log of timber. Gangrene supervened causing his death.
229	25th April, 11 A.M.	Bharatchak mine, Sunderchak P. O., Bengal.	B. N. Sanyal	Thakur Muchin, (f.), 36, <i>Labourer.</i>	Coal	Whilst deceased was sitting on the curb of a mortar mill, the buffaloes turning the mill took fright and bolted. Deceased was caught by the axle and crushed between it and the curb. She died shortly after. Inspection and inquiry made.
230	21st June, 1-30 P.M.	Godhur mine, Kusunda P. O., Bihar and Orissa.	S. B. Raha & Sons	Dukhni Beldarin, (f.), 13, <i>Labourer.</i>	Coal	Deceased was carrying a basket filled with debris on her head in a quarry, when she slipped and fell a distance of 10 feet. She sustained injuries to which she succumbed two hours later. Inspection and inquiry made.
231	6th July, 7-10 A.M.	Gazitan mine, Sijua P. O., Bihar and Orissa.	New Marbhoom Coal Co., Ltd.	Manda Mahomed Bux, (m.), 26, <i>Labourer.</i>	Coal	Deceased, whilst working on a scaffold fixed to a headgear, fell to the ground a distance of 25 feet. He received injuries from which he died three hours later. Inspection and inquiry made.
232	4th August, 5-30 P.M.	Burra Golai mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ltd.	Diliram Chetri, (m.), 26, <i>Labourer.</i>	Coal	Deceased was assisting to build a scaffold round a steel chimney 45 feet high, the top section of which had become distorted. A storm arose and the affected part of the chimney was displaced, striking deceased, who fell to the ground. He sustained serious injuries and died shortly afterwards. Inspection and inquiry made.

233	21st September, 9 A.M.	Bansdoopur mine, Kusunda P. O., Bihar and Orissa.	Bansdoopur Coal Co., Ltd.	Shew Prosad Chamar, (m.), 30, <i>Stone-cutter.</i>	Coal	Deceased was levering a piece of stone from the top of the seam in a quarry. He fell over the edge of the quarry along with the stone and received injuries from which he died. <i>Inspection and inquiry made.</i>
234	26th September, 7-30 P.M.	Phularitand mine, Katrasgarh P. O., Bihar and Orissa.	Phularitand Coal Co., Ltd.	Guni Dosadh, (m.), 30, <i>Engineman.</i>	Coal	The crank of a haulage engine was on "dead centre." Deceased was trying to pull the fly wheel of the engine round when he slipped and fell a distance of 4 feet. He sustained internal injuries and died eight hours later. <i>Inspection and inquiry made.</i>
235	10th October, 8-30 A.M.	Bansjorah mine, Bansjora P. O., Bihar and Orissa.	Bansjorah Coal Co., Ltd.	Behari Rajwar, (m.), 42, <i>Coal-cutter.</i>	Coal	During blasting operations in a quarry, deceased, on receiving the necessary warning, was leaving the quarry when he slipped and fell on some sharp stones. He sustained a deep cut on the neck and died an hour later from loss of blood. <i>Inspection and inquiry made.</i>
236	28th October, 8-45 A.M.	Shivrajpur mine, Shivrajpur P. O., Panch Mahals, Bombay.	Shivrajpur Syndicate, Ltd.	Laloo Badhar, (m.), 35, <i>Labourer.</i>	Manganese ore	Deceased, who was working on the steeply sloping surface of the face of a quarry, complained of feeling ill and, in getting down, slipped and fell a distance of seven feet. He died shortly afterwards. <i>Inspection and inquiry made.</i>
237	13th December, 11 A.M.	Dhori mine, Bokaro P. O., Bihar and Orissa.	Bokaro-Rangur, Ltd.	Dhukhiya Kolin, (f.), 43, <i>Coal-carrier.</i>	Coal	Deceased, whilst walking down a pathway in a quarry neglected to look where she was going and fell from a height of 12 feet, sustaining injuries to which she succumbed four days later. <i>Inspection and inquiry made.</i>



# APPENDIX II—contd.

86

## Fatal Accidents, 1923—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Reason for exclusion.	Cause of accident and remarks.
DEATHS NOT INCLUDED IN THE STATISTICS—(62 deaths).							
1	3rd January, 4 A.M.	Jatachappa mine, Chhindwara P. O., Central Provinces.	Upper Pench Coal Co., Ld.	Surajpal Singh, (m), 20, <i>Banksman.</i>	Coal	Not a mining accident.	Deceased was sleeping near a fire when his clothing became ignited, and he was severely burnt about the body. He died six days later. Inspection and inquiry made.
2	8th January, 7 P.M.	Pandaveswar mine, Pandaveswar P. O., Bengal.	Highfield Colliery, Ld.	Sona Manjhi, (m), 7, <i>Not employed;</i> Narayan Manjhi, (m), 30, <i>Coal-cutter.</i>	Coal	Not a mining accident.	The deceased were burnt by the ignition of gunpowder which had been brought to a miner's hut prior to being made into cartridges. They died seven and eight days, respectively, after the accident. Inspection and inquiry made.
3	11th January, 6 P.M.	Pretoria mine, Charanpur P. O., Bengal.	Seebpore Coal Co., Ld.	Mohan Turi, (m), 40, <i>Coal-cutter.</i>	Coal	Not a mining accident.	Deceased, a person of unsound mind, jumped down an airshaft, 60 feet deep, and was killed instantly. The shaft was fenced. Inspection and inquiry made.
4	11th January, 7-15 P.M.	Budroohuck mine, Sijua P. O., Bihar and Orissa.	Budroohuck Coal Mining Co., Ld.	Bhatu Manjhi, (m), 20, Ram Manjhi, (m), 20, Lalu Manjhi, (m.), 12, Kishan Manjhi, (m.), 30, <i>Coal-cutters ;</i> Sumi Majhian, (f.), 20, Sughia Mahaton, (f.), 20, <i>Coal-carriers.</i>	Coal	Not a mining accident.	The five deceased and four other persons were sitting in a miner's hut preparing cartridges from a heap of loose gunpowder when another person entered with a lighted lamp and accidentally set fire to the gunpowder. All were more or less severely burned. Inspection and inquiry made.
5	11th January, 9-15 P.M.	Soranpur mine, Girdih P. O., Bihar and Orissa.	East Indian Railway Co.	Mohar Chamar, (m.), 55.	Coal	Not employed	Deceased was run over by a locomotive, and sustained fatal injuries. Inspection and inquiry made.
6	8th February, 7 A.M.	Pandobera mine, Jharua P. O., Bihar and Orissa.	Pandobera Colliery Co.	Budhia Beldarin, (f.), 82.	Coal	Not employed	Deceased fell from a height of about 80 feet into a quarry containing mud and water. She was found buried in the mud, and died from shock and suffocation. Inspection and inquiry made.

7	10th February, 9 A.M.	Bagdigi mine, Jharia P. O., Bihar and Orissa.	Villiers, Ltd.	Sakharam Bilaspuri, (m.), 60.	Coal	Not employed	Deceased fell over the edge of a quarry, where overburden was being removed, sustaining injuries from which he died. Inspection and inquiry made.
8	13th February, 11 A.M.	Damaguria mine, Kulti P. O., Bengal.	Damaguria Coal Co., Ltd.	Panane Dhibar, (f.), 30, 1, + Coal-carrier.	Coal	Not a mining accident.	Whilst deceased was asleep in a straw hut in which a fire was burning, the hut caught fire. She received injuries from which she died on the following day. One other person received severe burns. Inspection and inquiry made.
9	About 1st March, Unknown.	Northern mine, Nawagarh P. O., Bihar and Orissa.	Northern Coal Co., Ltd.	Name unknown, (m.), Age unknown.	Coal	Not employed	Deceased fell into a shaft, 95 feet deep, and was killed. Inspection and inquiry made.
10	6th March, 7-30 A.M.	Golukdih mine, Jharia P. O., Bihar and Orissa.	N. M. Choudhuri	Tufani Noonina, (m.), 35, Loader.	Coal	Not a mining accident.	Whilst assisting in hand shunting wagons on a railway siding deceased was run over and fatally injured. Inspection and inquiry made.
11	23rd March, 6-30 A.M.	Khost mine, Khost P. O., Baluchistan.	North Western Railway	Adam, (m.), 30, Tramper.	Coal	Not a mining accident.	Whilst at work underground deceased complained of exhaustion. He was carried out of the mine, but died before he reached the surface. Death was ascribed to heart failure. Inspection and inquiry made.
12	25th April, 7 P.M.	Hot Kandra mine, Pathardih P. O., Bihar and Orissa.	Narayanjee Dhanjee Shah.	Baran Miyan, (m.), 22, Coal-cutter.	Coal	Not a mining accident.	Deceased was drowned whilst bathing in a quarry containing about 50 feet of water. Inspection and inquiry made.
13	16th May, 7-30 A.M.	Kusunda mine, Kusunda P. O., Bihar and Orissa.	K. M. Selected Coal Co.	Amola Bumia, (f.), 15, Loader.	Coal	Not a mining accident.	Deceased was found drowned in a properly fenced well. Inspection and inquiry made.
14	18th May, 10-30 A.M.	Alkusa North mine, Kusunda P. O., Bihar and Orissa.	Raneegunge Coal Association, Ltd.	Muradha, (m.), 35, Labourer ; Bhagia, (f.), 13, Sumri, (f.), 12, Jira, (f.), 10, Kasi, (f.), 13, Shale pickers.	Coal	Not a mining accident.	Some straw saturated with coal tar had been thrown out of a railway wagon and was lying on the ground. Some one lighted the straw and it rapidly burst into flame and ignited other straw lying in the bottom of the wagon. The deceased woman and children who were clearing out the wagon at the time were severely burnt and all of them died within an hour. Muradha who went into the burning wagon to rescue his daughter was burnt to death. Inspection and inquiry made.
15	22nd May, 10-30 A.M.	Nichitpur mine, Bansjora P. O., Bihar and Orissa.	A. C. Banerjee & Co.	Durga Bhuiya, (m.), 30, Labourer.	Coal	Not a mining accident.	Deceased, whilst pushing a railway wagon, was crushed between the buffers of the latter and another wagon which collided with it from the rear. He received injuries from which he died almost immediately. Inspection and inquiry made.
16	30th May, 5 A.M.	Kurhurbareo mine, Giridih P. O., Bihar and Orissa.	East Indian Railway Co.	Gondia Passin, (f.), 50, Labourer.	Coal	Not a mining accident.	The deceased was run over by a pilot engine on the broad gauge line. Inspection and inquiry made.

# APPENDIX II—contd.

## Fatal Accidents, 1923—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Reason for exclusion.	Cause of accident and remarks.
DEATHS NOT INCLUDED IN THE STATISTICS—(62 deaths)—contd.							
17	30th May, 6-30 P.M.	Noonodih mine, Jamtoba P. O., Bihar and Orissa.	Bengal Iron Co., Ltd.	Behari Gowala, (m.), 35, Coal-cutter.	Coal	Not a mining accident.	Deceased took 4 lb. of loose gunpowder in a canister into his house where it became ignited by some unknown means. He sustained serious burns and died four days later. Inspection and inquiry made.
18	1st June, 11 A.M.	Ekra Khas mine, Bansjora P. O., Bihar and Orissa.	Maharaja of Cossimbazar	Madhoo, (m.), 35, Biswaswar, (m.), 22, Coal-cutters; Ganga, (f.), 7, Phacktir, (f.), 2, Not employed.	Coal	Not a mining accident.	The deceased were in a miner's hut and were burnt by the ignition of some gunpowder which had been taken there instead of down the mine. Inspection and inquiry made.
19	8th June, 3-30 P.M.	New Tetturya mine, Katragarh, P. O., Bihar and Orissa.	New Tetturya Coal Co., Ltd.	Pairee Noonla, (f.), 6.	Coal	Not employed	Deceased was found drowned in a boiler feed tank. Inspection and inquiry made.
20	10th June, 4-30 P.M.	Patmohna mine, Sitarampur P. O., Bengal.	Patmohna Collieries, Ltd.	Gopal Manjhi, (m.), 12.	Coal	Not employed	Deceased climbed a standard carrying an 11,000 volts transmission line, for the purpose of getting a dead bird which was on the conductors. He came into contact with the line and received a shock of about 6,380 volts causing injuries from which he died on the following day. Inspection and inquiry made.
21	22nd June, 2-30 P.M.	Teesra mine, Jharia P. O., Bihar and Orissa.	Amarsingh Gowamal	Ganpat, (m.), 28, Coal-cutter.	Coal	Not a mining accident.	Deceased, whilst sitting at the entrance to his hut, was struck by lightning and killed instantly. Inspection and inquiry made.
22	2nd July, 10 A.M.	Sendra mine, Bansjora P. O., Bihar and Orissa.	Sendra Coal Co., Ltd.	Mungli Majhian, (f.), 29, Coal-carrier.	Coal	Not a mining accident.	Deceased was severely burnt by an ignition of gunpowder which occurred in her house. Inspection and inquiry made.
23	23rd July, 5 P.M.	Central Bansjora mine, Bansjora P. O., Bihar and Orissa.	Central Bansjora Colliery Co.,	Safaroo Kole, (m.), 3½	Coal	Not employed	Deceased wandered on to a surface tram line unobserved. He was run over by the first full tub of a set of four which was being pushed. He sustained serious injuries to which he succumbed eight days later. Inspection and inquiry made.

24	24th July, 12-30 P.M.	Bankola mine, Ukhra P. O., Bengal.	Burrakur Coal Co., Ltd.	Mathani Baurin, (f.), 12, Kuturi Baurin, (f.), 13, Bhadu Baurin, (f.), 65, Sindhu Baurin, (f.), 11, Mahendra Bauri, (m.), 34, <i>Labourers.</i>	Coal	Not a mining accident	Whilst a number of coolies were taking shelter from the rain under the roof of the boiler house a quantity of gunpowder which had been placed on top of the boilers to dry was accidentally ignited. Seven persons, three of whom died within twenty-four hours, were severely burnt. Inspection and inquiry made.
25	26th July, 12-45 P.M.	Ballarpur mine, Ballarpur P. O., Central Provinces.	Sir K. C. Daga and Bros. and Hon'ble Sir M. B. Dadabhoj.	Sale Bakhi, (f.), 12, <i>Labourer.</i>	Coal	Not a mining accident.	Deceased was run over by a locomotive in the colliery siding. She sustained fatal injuries. Inspection and inquiry made.
26	21st August, 1 P.M.	Garbhapur mine, Chipurupalli P. O., Madras.	Vizianagram Mining Co., Ltd.	Reddy Chenaryya, (m.), 40, <i>Storekeeper.</i>	Manganese	Not a mining accident.	Intending to smoke, deceased struck a light in a gunpowder factory. An explosion took place and he was fatally burned.
27	23rd August, 6-30 A.M.	Kusoonda and Nyadeo mine, No. 2 Division, Kusoonda P. O., Bihar and Orissa.	Kusoonda and Nyadeo Collieries, Ltd.	Somaru Dhorked, (m.), 32, <i>Coal-cutter</i> ; Mangloo Dhorked, (f.), 22, <i>Coal-carrier.</i>	Coal	Not a mining accident.	Somaru was making up cartridges near a fire at his dwelling house when a spark from the fire blew on to the loose powder and ignited it. Mangloo, who was standing near by, sustained serious burns and died about a day later. Somaru was also badly burnt and died two days later. Inspection and inquiry made.
28	24th August, 10 A.M.	Jamadoba mine, Jamadoba P. O., Bihar and Orissa.	Tata Iron & Steel Co., Ltd.	Bikha, (m.), 22, <i>Trolleyman.</i>	Coal	Not a mining accident.	Deceased was drowned in a bathing tank, 12 feet deep. Inspection and inquiry made.
29	24th August, 7 P.M.	Madhuband mine, Nadkharkee P. O., Bihar and Orissa.	Burrakur Coal Co., Ltd.	Kalli Beldarini, (f.), 24, <i>Coal-carrier.</i>	Coal	Not a mining accident.	Whilst drawing water from a well 60 feet deep, deceased fell in and was drowned. Inspection and inquiry made.
30	26th August, 7 P.M.	Jamadoba mine, Jamadoba P. O., Bihar and Orissa.	Tata Iron & Steel Co., Ltd.	Batasi, (f.), 1½.	Coal	Not employed	Deceased fell into a boiler feed tank and was drowned. Inspection and inquiry made.
31	10th September, 8 P.M.	Bagdigi mine, Jharia P. O., Bihar and Orissa.	Villiers, Ltd.	Kartick Chandra Sahana, (m.), 30, <i>Cook.</i>	Coal	Not employed	Deceased was killed by the collapse of a house due to a premature subsidence of underground workings. Inspection and inquiry made.
32	2nd October, Unknown.	Kharkharee and Mohesh- pur mine, Katrasgarh P. O., Bihar and Orissa.	Kharkharee Collieries, Ltd.	Neoki Bhuiyan, (f.), 35, <i>Labourer.</i>	Coal	Not a mining accident.	Deceased was found drowned in a well. The well had a properly built superstructure. Inspection and inquiry made.
33	8th November, Unknown.	Patmohna mine, Sitarampur P. O., Bengal.	Patmohna Collieries, Ltd.	Biswanath Singh, (m.), 50, <i>Store-peon.</i>	Coal	Not a mining accident.	Deceased went to sleep in a closed room where a fire was burning. He was asphyxiated.

## Fatal Accidents, 1923—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Reason for exclusion.	Cause of accident and remarks.
DEATHS NOT INCLUDED IN THE STATISTICS—(62 deaths)—contd.							
34	9th November, 2-30 A.M.	Egaroor mine, Mugma, P. O., Bihar and Orissa.	Egaroor Coal Association.	Rajbullabh Singh, (m.), 40, Peon.	Coal	Not a mining accident.	Deceased went to sleep in a closed room with an open fire burning. On the following morning he was found to have been asphyxiated. Inspection and inquiry made.
35	23rd November, 6-30 P.M.	Choitodih mine, Katrasgarh P. O., Bihar and Orissa.	Burrakur Coal Co., Ltd.	Noman Gope, (m.), 25, Labourer.	Coal	Not a mining accident.	Deceased entered a water-logged quarry presumably for the purpose of bathing, got out of his depth and was drowned. Inspection and inquiry made.
36	30th November, Unknown.	Suratand mine, Jharua P. O., Bihar and Orissa.	Suratand Coal Co., Ltd.	Parneswar Lala, (m.), 3.	Coal	Not employed	Deceased fell down a shaft, 60 feet deep, and was killed. Inspection and inquiry made.
37	5th December, 7 A.M.	Ghugus mine, Ballarpur P. O., Central Provinces.	Sir K. C. Daga and Bros. and Hon'ble Sir M. Dadabhoy.	Bajinath, (m.), 38, Screen Mate.	Coal	Not a mining accident.	Deceased was crushed between two wagons during shunting operations on a railway siding.
38	16th December, 7 A.M.	Bhalgora mine, Jharua P. O., Bihar and Orissa.	Bhalgora Coal Co., Ltd.	Biseswar Ojha, (m.), 25, Labourer.	Coal	Not a mining accident.	Deceased attempted to cross in front of a railway train and was knocked down and killed. Inspection and inquiry made.
39	19th December, 2 P.M.	Bararee mine, Jamadoba P. O., Bihar and Orissa.	East Indian Coal Co., Ltd.	Mohan Bhuiya, (m.), 4.	Coal	Not employed	Deceased was buried by a fall of loose debris in a quarry. Inspection and inquiry made.
40	19th December, 2-30 P.M.	Jharua Khas mine, Jharua P. O., Bihar and Orissa.	Seth Khora Ramji	Bhatua Noonina, (f.), 3.	Coal	Not employed	Deceased fell into a blow-off drain from a range of boilers when one of the boilers was being blown off and was scalded to death. Inspection and inquiry made.
1	27th December, 12 P.M.	Bhalgora mine, Jharua P. O., Bihar and Orissa.	Bhalgora Coal Co., Ltd.	Ram Bharas, (m.), 32, Sirdar; Brij Lal, (m.), 30, Coal-cutter; Gurbarin, (f.), 28, Rupatin, (f.), 26, Coal-carriers.	Coal	Not a mining accident.	The deceased were burnt to death by an explosion of gunpowder in their dwelling house. Inspection and inquiry made.

Fatal and serious accidents in and about mines regulated by the Indian Mines Act, 1901, during the year 1923.

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# APPENDIX II—contd.

## Fatal Accidents, 1923—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral wrought.	Reason for exclusion.	Cause of accident and remarks.
<b>DEATHS NOT INCLUDED IN THE STATISTICS—(62 deaths)—contd.</b>							
34	9th November, 2-30 A.M.	Egaroor mine, Mugma, P. O., Bihar and Orissa.	Egaroor Coal Association.	Rajbullah Singh, (m.), 40, <i>Peon.</i>	Coal	Not a mining accident.	Deceased went to sleep in a closed room with an open fire burning. On the following morning he was found to have been asphyxiated. Inspection and inquiry made.
35	23rd November, 6-30 P.M.	Choitodih mine, Katrasgarh P. O., Bihar and Orissa.	Burrakur Coal Co., Ltd.	Neman Gope, (m.), 25, <i>Labourer.</i>	Coal	Not a mining accident.	Deceased entered a water-logged quarry presumably for the purpose of bathing, got out of his depth and was drowned. Inspection and inquiry made.
36	30th November, Unknown.	Suratand mine, Jharia P. O., Bihar and Orissa.	Suratand Coal Co., Ltd.	Parneswar Lala, (m.), 3.	Coal	Not employed	Deceased fell down a shaft, 60 feet deep, and was killed. Inspection and inquiry made.
37	5th December, 7 A.M.	Ghugus mine, Ballarpur P. O., Central Provinces.	Sir K. C. Daga and Bros. and Hon'ble Sir M. Dadabhoy.	Baijnath, (m.), 38, <i>Screen Mate.</i>	Coal	Not a mining accident.	Deceased was crushed between two wagons during shunting operations on a railway siding.
38	16th December, 7 A.M.	Bhargora mine, Jharia P. O., Bihar and Orissa.	Bhargora Coal Co., Ltd.	Biseswar Ojha, (m.), 25, <i>Labourer.</i>	Coal	Not a mining accident.	Deceased attempted to cross in front of a railway train and was knocked down and killed. Inspection and inquiry made.
39	19th December, 2 P.M.	Bararee mine, Jamadoba P. O., Bihar and Orissa.	East Indian Coal Co., Ltd.	Mohan Bhuiya, (m.), 4.	Coal	Not employed	Deceased was buried by a fall of loose <i>débris</i> in a quarry. Inspection and inquiry made.
40	19th December, 2-30 P.M.	Jharia Khas mine, Jharia P. O., Bihar and Orissa.	Seth Khora Ramji	Bhatna Noonina, (f.), 3.	Coal	Not employed	Deceased fell into a blow-off drain from a range of boilers when one of the boilers was being blown off and was scalded to death. Inspection and inquiry made.
1	27th December, 12 P.M.	Bhargora mine, Jharia P. O., Bihar and Orissa.	Bhargora Coal Co., Ltd.	Ram Bhuras, (m.), 32, <i>Sirdar ;</i> Brij Lal, (m.), 30, <i>Coal-cutter ;</i> Gurbarin, (f.), 28, Rupatin, (f.), 26, <i>Coal-carriers.</i>	Coal	Not a mining accident.	The deceased were burnt to death by an explosion of gunpowder in their dwelling house. Inspection and inquiry made.

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Fatal and serious accidents in and about mines regulated by the Indian Mines Act, 1901, during the year 1923.

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## APPENDIX II—contd.

Table No. 2—contd.

Fatal and serious accidents in and about mines regulated by the Indian Mines Act, 1901, during the year 1923—contd.

PROVINCE.	District and mineral field.	Total average number of persons employed daily.	FATAL ACCIDENTS.				SERIOUS ACCIDENTS.				DEATH-RATE PER 1,000 PERSONS EMPLOYED.		
			Number of separate fatal accidents.	NUMBER OF DEATHS.			Number of serious non-fatal accidents.	NUMBER OF PERSONS SERIOUSLY INJURED.			Below ground.	Above ground.	Below and above ground.
				Below ground.	Above ground.	Total deaths.		Below ground.	Above ground.	Total number of persons injured.			
Central Provinces	Betul . . . . . Chanda, Ballarpur . . . . . Chhindwara, Pench Valley . . . . . Narsin_gpur, Mohpani . . . . . Yeotmal . . . . .	203	..	..	..	..	..	..	..	..	..	..	..
		2,082	4	11	..	11	1	1	..	1	9.78	..	5.28
		5,784	2	18	..	18	14	10	7	17	5.19	..	3.11
		1,699	1	1	..	1	..	..	..	..	.90	..	.59
		45	..	..	..	..	..	..	..	..	..	..	..
	TOTAL	9,813	7	30	..	30	15	11	7	18	5.17	..	3.06
Punjab . . .	Jhelum . . . . . Mianwali . . . . . Shahpur . . . . .	1,257	1	1	..	1	1	1	..	1	1.34	..	.80
		139	..	..	..	..	..	..	..	..	..	..	..
		148	..	..	..	..	..	..	..	..	..	..	..
	TOTAL	1,544	1	1	..	1	1	1	..	1	1.15	..	.65
	GRAND TOTAL (COAL)	182,601	194	312	20	332	220	169	72	241	2.86	.27	1.82
Bihar and Orissa	Bilaspur . . . . . Gaya . . . . . Hazaribagh . . . . . Monghyr . . . . . Sambalpur . . . . .	..	..	..	..	..	..	..	..	..	..	..	..
		765	..	..	..	..	1	1	..	1	..	..	..
		7,311	3	3	..	3	1	1	..	1	.60	..	.41
		49	..	..	..	..	..	..	..	..	..	..	..
		84	..	..	..	..	..	..	..	..	..	..	..
	TOTAL	8,209	3	3	..	3	2	2	..	2	.53	..	.37
Madras . . .	Nellore . . . . . Nilgiris . . . . .	1,968	..	..	..	..	..	..	..	..	..	..	..
		100	1	7	..	7	..	..	..	..	134.62	..	70.00
	TOTAL	2,068	1	7	..	7	..	..	..	..	5.87	..	3.38
Rajputana . .	Ajmer-Merwara . . . . .	302	..	..	..	..	..	..	..	..	..	..	..
	GRAND TOTAL (MICA)	10,579	4	10	..	10	2	2	..	2	1.40	..	.95

## APPENDIX II—contd.

Table No. 2—contd.

Fatal and serious accidents in and about mines regulated by the Indian Mines Act, 1901, during the year 1923—contd.

PROVINCE.	District and mineral field.	Total average number of persons employed daily.	FATAL ACCIDENTS.				SERIOUS ACCIDENTS.			DEATH-RATE PER 1,000 PERSONS EMPLOYED.			
			Number of separate fatal accidents.	NUMBER OF DEATHS.			Number of serious non-fatal accidents.	NUMBER OF PERSONS SERIOUSLY INJURED.		Total number of persons injured.	Below ground.	Above ground.	Below and above ground.
				Below ground.	Above ground.	Total deaths.		Below ground.	Above ground.				
			C.—MANGANESE ORE.										
Bombay . . . .	Panch Mahals . . . .	1,404	1	..	1	1	4	..	4	4	..	2.39	.71
Central Provinces	Balaghat . . . .	5,574	2	2	..	2	1	..	1	1	4.48	..	.36
	Bhandara . . . .	1,277	1	1	..	1	..	..	..	..	1.05	..	.78
	Chhindwara . . . .	842	..	..	..	..	..	..	..	..	..	..	..
	Jubbulpore . . . .	29	..	..	..	..	..	..	..	..	..	..	..
	Nagpur . . . .	4,784	1	1	..	1	7	3	4	7	.27	..	.21
	TOTAL . . . .	12,506	4	4	..	4	8	3	5	8	.43	..	.32
Madras . . . .	Bellary . . . .	515	..	..	..	..	..	..	..	..	..	..	..
	Vizagapatam . . . .	1,204	..	..	..	..	..	..	..	..	..	..	..
	TOTAL . . . .	1,719	..	..	..	..	..	..	..	..	..	..	..
	GRAND TOTAL (MANGANESE ORE) . . . .	15,629	5	4	1	5	12	3	9	12	.34	.26	.32
			D.—LIMESTONE.										
Burma . . . .	Northern Shan States . . . .	288	..	..	..	..	..	..	..	..	..	..	..
Central Provinces	Bilaspur . . . .	193	..	..	..	..	..	..	..	..	..	..	..
	Jubbulpore-Katni . . . .	6,427	..	..	..	..	4	2	2	4	..	..	..
	TOTAL . . . .	6,620	..	..	..	..	4	2	2	4	..	..	..
	GRAND TOTAL (LIMESTONE). . . .	6,908	..	..	..	..	4	2	2	4	..	..	..
			E.—SALT.										
Punjab . . . .	Jhelum . . . .	486	1	1	..	1	2	2	..	2	2.00	..	2.00
	Mianwali . . . .	41	..	..	..	..	..	..	..	..	..	..	..
	Shahpur . . . .	73	..	..	..	..	..	..	..	..	..	..	..
	GRAND TOTAL (SALT) . . . .	600	1	1	..	1	2	2	..	2	1.67	..	1.67
			F.—GEMS.										
Burma . . . .	Katha (Rubies, etc.) . . . .	1,285	..	..	..	..	1	1	..	1	..	..	..

## APPENDIX II—contd.

Table No. 2—contd.

Fatal and serious accidents in and about mines regulated by the Indian Mines Act, 1901, during the year 1923—contd.

PROVINCE.	District and mineral field.	Total average number of persons employed daily.	FATAL ACCIDENTS.				SERIOUS ACCIDENTS.				DEATH-RATE PER 1,000 PERSONS EMPLOYED.			
			Number of separate fatal accidents.	NUMBER OF DEATHS.			Number of serious non-fatal accidents.	PERSONS SERIOUSLY INJURED.			Below ground.	Above ground.	Below and above ground.	
				Below ground.	Above ground.	Total deaths.		Below ground.	Above ground.	Total number of persons injured.				
G.—SLATE.														
Bihar and Orissa	Monghyr . . . . .	416	..	..	..	..	..	..	..	..	..	..	..	..
Punjab	Gurdaspur . . . . .	..	..	..	..	..	..	..	..	..	..	..	..	..
	Gurgaon . . . . .	180	..	..	..	..	..	..	..	..	..	..	..	..
	Kangra . . . . .	263	1	1	..	1	..	..	..	..	5.49	..	3.80	..
	TOTAL . . . . .	443	1	1	..	1	..	..	..	..	2.99	..	2.26	..
	GRAND TOTAL (SLATE) . . . . .	859	1	1	..	1	..	..	..	..	1.59	..	1.61	..
H.—GOLD.														
Bihar and Orissa	Singhbhum . . . . .	..	..	..	..	..	..	..	..	..	..	..	..	..
Madras	Anantapur . . . . .	275	..	..	..	..	..	..	..	..	..	..	..	..
	GRAND TOTAL (GOLD) . . . . .	275	..	..	..	..	..	..	..	..	..	..	..	..
I.—IRON ORE.														
Bihar and Orissa	Puri . . . . .	..	..	..	..	..	..	..	..	..	..	..	..	..
	Singhbhum . . . . .	2,418	4	2	3	5	5	..	5	5	2.18	2.00	2.07	..
	TOTAL . . . . .	2,418	4	2	3	5	5	..	5	5	2.18	2.00	2.07	..
Burma	Mandalay . . . . .	150	..	..	..	..	..	..	..	..	..	..	..	..
	Northern Shan States . . . . .	1,060	..	..	..	..	1	..	1	1	..	..	..	..
	TOTAL . . . . .	1,210	..	..	..	..	1	..	1	1	..	..	..	..
Central Provinces	Chanda . . . . .	252	1	1	..	1	..	..	..	..	12.66	..	3.97	..
	GRAND TOTAL (IRON ORE) . . . . .	3,880	5	3	3	6	6	..	6	6	1.77	1.37	1.55	..

## APPENDIX II—contd.

Table No. 2—contd.

Fatal and serious accidents in and about mines regulated by the Indian Mines Act, 1901, during the year 1923—contd.

PROVINCE.	District and mineral field.	Total average number of persons employed daily.	FATAL ACCIDENTS.				SERIOUS ACCIDENTS.				DEATH-RATE PER 1,000 PERSONS EMPLOYED.			
			Number of separate fatal accidents.	NUMBER OF DEATHS.			Number of serious non-fatal accidents.	NUMBER OF PERSONS SERIOUSLY INJURED.			Below ground.	Above ground.	Below and above ground.	
				Below ground.	Above ground.	Total deaths.		Below ground.	Above ground.	Total number of persons injured.				
J.—TIN AND WOLFRAM ORE.														
Burma	Mergui . . . . .	617	4	4	..	4	..	..	..	..	9.64	..	6.48	
	Tavoy . . . . .	2,316	4	3	1	4	5	2	4	6	1.59	2.34	1.73	
	Thaton . . . . .	17	..	..	..	..	..	..	..	..	..	..	..	
	GRAND TOTAL (TIN AND WOLFRAM ORE).	2,950	8	7	1	8	5	2	4	6	3.02	1.58	2.71	
K.—MAGNESITE.														
Madras	Salem . . . . .	1,562	1	..	1	1	2	..	2	2	..	5.65	.64	
L.—CHROMITE ORE.														
Baluchistan	Quetta-Pishin . . . . .	33	..	..	..	..	..	..	..	..	..	..	..	
	Zhob . . . . .	513	1	..	1	1	2	1	1	2	..	3.69	1.95	
	TOTAL . . . . .	546	1	..	1	1	2	1	1	2	..	3.56	1.83	
Bihar and Orissa	Singhbhum . . . . .	155	..	..	..	..	..	..	..	..	..	..	..	
	GRAND TOTAL (CHROMITE ORE).	701	1	..	1	1	2	1	1	2	..	3.16	1.43	
M.—COPPER ORE.														
Bihar and Orissa	Singhbhum . . . . .	2,672	4	4	..	4	4	6	..	6	3.22	..	1.50	
Central Provinces	Balaghat . . . . .	46	..	..	..	..	..	..	..	..	..	..	..	
	GRAND TOTAL (COPPER ORE)	2,718	4	4	..	4	4	6	..	6	3.14	..	1.47	
N.—BAUXITE.														
Bombay	Kaira . . . . .	195	..	..	..	..	..	..	..	..	..	..	..	
O.—CLAY.														
Bihar and Orissa	Manbhum . . . . .	1	..	..	..	..	..	..	..	..	..	..	..	
	Palamau . . . . .	78	1	1	..	1	..	..	..	..	38.46	..	12.82	
	TOTAL . . . . .	79	1	1	..	1	..	..	..	..	38.46	..	12.66	
Central Provinces	Jubbulpore . . . . .	405	..	..	..	..	..	..	..	..	..	..	..	
Delhi	Delhi . . . . .	57	1	1	..	1	..	..	..	..	33.33	..	17.54	
	GRAND TOTAL (CLAY)	541	2	2	..	2	..	..	..	..	4.65	..	3.70	

## APPENDIX II—contd.

Table No. 2—contd.

Fatal and serious accidents in and about mines regulated by the Indian Mines Act, 1901,  
during the year 1923—concl'd.

PROVINCE.	District and mineral field.	Total average member of persons employed.	FATAL ACCIDENTS.				SERIOUS ACCIDENTS.				DEATH RATE PER 1,000 PERSONS EMPLOYED.		
			Number of separate fatal accidents.	NUMBER OF DEATHS.			Number of serious non-fatal accidents.	NUMBER OF PERSONS SERIOUSLY INJURED.			Below ground.	Above ground.	Below and above ground.
				Below ground.	Above ground.	Total deaths.		Below ground.	Above ground.	Total number of persons injured.			
Burma . . .	{ Northern Shan States . . Southern Shan States . .	2,669	11	16	..	16	60	53	7	60	8.21	..	5.99
		85	..	..	..	..	..	..	..	..	..	..	
	GRAND TOTAL (LEAD ORE).	2,754	11	16	..	16	60	53	7	60	7.99	..	5.81
Central Provinces	Jubbulpore . . . .	238	..	..	..	..	..	..	..	..	..	..	..
		13	..	..	..	..	..	..	..	..	..	..	
	{ Kurnool . . . . . Nellore . . . . .	33	..	..	..	..	..	..	..	..	..	..	..
TOTAL . . . . .		46	..	..	..	..	..	..	..	..	..	..	
	GRAND TOTAL (STEATITE)	284	..	..	..	..	..	..	..	..	..	..	
Bihar and Orissa .	Singhbhum . . . .	109	..	..	..	..	..	..	..	..	..	..	
Central Provinces	Betul . . . . .	5	..	..	..	..	..	..	..	..	..	..	..
		24	..	..	..	..	..	..	..	..	..	..	
	GRAND TOTAL (OCHRE) .	254	..	..	..	..	..	..	..	..	..	..	
Bihar and Orissa Madras . . . . .	Singhbhum . . . . Kurnool . . . . .	104 62	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	
		GRAND TOTAL (BARYTES)	166	..	..	..	..	..	..	..	..	..	
	Burma . . . . .	Katha . . . . .	9	..	..	..	..	..	..	..	..	..	..
	GRAND TOTAL (ALL MINES).	234,864	237	360	27	387	320	241	103	314	2.47	.30	1.65

## APPENDIX II—contd.

Table No. 3.

Fatal accidents in mines regulated by the Indian Mines Act, 1901, during the year 1923, classified according to the age and sex of the workers—contd.

MINERAL.	PROVINCE AND MINERAL FIELD.	Number of separate fatal acci- dents.	NUMBER OF DEATHS.								TOTAL BELOW AND ABOVE GROUND.		
			BELOW GROUND.				ABOVE GROUND.						
			Adult males.	Adult females.	Children (under 12).	TOTAL.	Adult males.	Adult females.	Children (under 12).	TOTAL.			
COAL	Assam . . . . .	Lakhimpur . . . . .	12	11	1	..	12	1	..	..	1	13	
		Naga Hills . . . . .	..	..	..	..	..	..	..	..	..	..	
		TOTAL . . . . .	12	11	1	..	12	1	..	..	1	13	
	Baluchistan . . . . .	Quetta, Pishin . . . . .	..	..	..	..	..	..	..	..	..	..	
		Sibi, Khost . . . . .	4	4	..	..	4	..	..	..	..	4	
		TOTAL . . . . .	4	4	..	..	4	..	..	..	..	4	
	Bengal, Burdwan, Raniganj . . . . .		56	54	15	..	69	2	1	1	4	73	
	Bihar and Orissa.	Hazaribagh {	Bokaro . . . . .	2	2	5	..	7	..	1	..	1	8
			Giridih . . . . .	7	4	3	..	7	..	..	..	..	7
			Jharia . . . . .	..	..	..	..	..	..	..	..	..	..
			Ramgarh . . . . .	1	..	1	..	1	..	..	..	..	1
		Manbhum {	Jharia . . . . .	89	70	21	1	92	10	2	..	12	104
			Raniganj . . . . .	12	62	23	..	85	1	1	..	2	87
		Palamau, Daltonganj . . . . .		..	..	..	..	..	..	..	..	..	..
		Sambalpur, Hingir- Rampur . . . . .		2	3	..	..	3	..	..	..	..	3
		Sonthal Parganas {	Jainty . . . . .	1	1	..	..	1	..	..	..	..	1
			Raniganj . . . . .	..	..	..	..	..	..	..	..	..	..
		TOTAL . . . . .	114	142	53	1	196	11	4	..	15	211	
	Central Provinces	{	Betul . . . . .	..	..	..	..	..	..	..	..	..	..
			Chanda . . . . .	4	7	4	..	11	..	..	..	..	11
			Chhindwara . . . . .	2	12	5	1	18	..	..	..	..	18
			Narsinghpur . . . . .	1	..	1	..	1	..	..	..	..	1
		TOTAL . . . . .	7	19	10	1	30	..	..	..	..	30	
	Punjab, Jhelum . . . . .		1	1	..	..	1	..	..	..	..	1	
	TOTAL (COAL) . . . . .		194	231	79	2	312	14	5	1	20	322	
MICA . . . . .	Bihar and Orissa, Hazaribagh . . . . .		3	3	..	..	3	..	..	..	..	3	
	Madras, Nilgiris . . . . .		1	7	..	..	7	..	..	..	..	7	
	TOTAL (MICA) . . . . .		4	10	..	..	10	..	..	..	..	10	

APPENDIX II—*concl.*Table No. 3—*concl.*

Fatal accidents in mines regulated by the Indian Mines Act, 1901, during the year 1923, classified according to the age and sex of the workers—*concl.*

MINERAL.	PROVINCE AND MINERAL FIELD.	Number of separate fatal accidents.	NUMBER OF DEATHS.								TOTAL BELOW AND ABOVE GROUND.
			BELOW GROUND.				ABOVE GROUND.				
			Adult males.	Adult females.	Children (under 12).	TOTAL.	Adult males.	Adult females.	Children (under 12).	TOTAL.	
MANGANESE ORE	Bombay, Panch Mahals . .	1	..	..	..	..	1	..	..	1	1
	Central Provinces { Balaghat . Bhandara Nagpur .	2	2	..	..	2	..	..	..	..	2
		1	..	1	..	1	..	..	..	..	1
		1	1	..	..	1	..	..	..	..	1
	TOTAL	4	3	1	..	4	..	..	..	..	4
TOTAL (MANGANESE ORE)	5	3	1	..	4	1	..	..	1	5	
SALT . . . . .	Punjab { Jhelum . . Mianwali . .	1	1	..	..	1	..	..	..	..	1
		..	..	..	..	..	..	..	..	..	..
	TOTAL (SALT)	1	1	..	..	1	..	..	..	..	1
Slate . . . . .	Punjab, Kangra . . . . .	1	1	..	..	1	..	..	..	..	1
IRON ORE . . . .	Bihar and Orissa, Singhbhum .	4	1	1	..	2	2	1	..	3	5
	Central Provinces, Chanda .	1	1	..	..	1	..	..	..	..	1
	TOTAL (IRON ORE)	5	2	1	..	3	2	1	..	3	6
WOLFRAM ORE .	Burma { Mergui . . Tavoy . .	..	..	..	..	..	..	..	..	..	..
		3	2	..	..	2	1	..	..	1	3
	TOTAL (WOLFRAM ORE)	3	2	..	..	2	1	..	..	1	3
MAGNESITE . . .	Madras, Salem . . . . .	1	..	..	..	..	1	..	..	1	1
CHROMITE ORE . .	Baluchistan, Zhob . . . . .	1	..	..	..	..	1	..	..	1	1
COPPER ORE . . .	Bihar and Orissa, Singhbhum .	4	3	1	..	4	..	..	..	..	4
	Bihar and Orissa, Palamau .	1	1	..	..	1	..	..	..	..	1
	Delhi . . . . .	1	1	..	..	1	..	..	..	..	1
TOTAL (CLAY)	2	2	..	..	2	..	..	..	..	2	
LEAD ORE . . . .	Burma, Northern Shan States .	11	16	..	..	16	..	..	..	..	16
TIN ORE . . . . .	Burma { Mergui . . Tavoy . .	4	4	..	..	4	..	..	..	..	4
		1	1	..	..	1	..	..	..	..	1
	TOTAL (TIN ORE)	5	5	..	..	5	..	..	..	..	5
GRAND TOTAL (ALL MINERALS)		237	276	82	2	360	20	6	1	27	387

APPENDIX II—*concl'd.*

Table No. 4.

Fatal accidents in mines regulated by the Indian Mines Act, 1901, during the year 1923, classified according to cause of accident.

Mineral worked.	Number of separate fatal accidents.	NUMBER OF PERSONS KILLED.												DEATH-RATE PER 1,000 PERSONS EMPLOYED.		
		Explosions of fire-damp.	Falls of roof.	Falls of side.	In shafts.	Suffocation by gases.	By explosives.	Irruptions of water.	Haulage.	Miscellaneous below ground.	Electricity.	Surface.	Total deaths.	Below ground.	Above ground.	Below and above ground.
Coal . . .	194	75	89	77	18	12	10	..	26	10	3	12	332	2-36	27	1-32
Chromite Ore .	1	..	..	..	..	..	..	..	..	..	..	1	1	..	3-16	1-43
Clay . . .	2	..	..	1	1	..	..	..	..	..	..	..	2	4-65	..	3-70
Copper Ore .	4	..	..	..	4	..	..	..	..	..	..	..	1	3-14	..	1-47
Iron Ore . . .	5	..	..	3	..	..	..	..	..	..	..	3	6	1-77	1-37	1-55
Lead Ore . . .	11	..	3	1	8	..	..	..	2	2	..	..	16	7-99	..	5-81
Magnesite .	1	..	..	..	..	..	..	..	..	..	..	1	1	..	5-65	·64
Manganese Ore .	5	..	..	2	1	..	1	..	..	..	..	1	5	3-1	·96	·32
Mica . . .	4	..	..	10	..	..	..	..	..	..	..	..	16	1-40	..	·95
Salt . . .	1	..	..	..	..	..	..	..	1	..	..	..	1	1-67	..	1-67
Slate . . .	1	..	..	1	..	..	..	..	..	..	..	..	1	1-59	..	1-16
Tin Ore . . .	5	..	..	5	..	..	..	..	..	..	..	..	5	3-02	1-58	2-71
Wolfram Ore .	3	..	..	1	..	..	..	..	..	1	..	1	3			
TOTAL 1923 .	237	75	92	101	32	12	11	..	29	13	3	19	387	2-47	·30	1-65
TOTAL PRECEDING YEAR.	205	21	57	65	35	..	9	1	20	10	3	22	243	1-57	·31	1-06
DIFFERENCE .	+32	+54	+35	+36	-3	+12	+2	-1	+9	+3	..	-3	+144	+·90	-·01	+·59



## APPENDIX III.

Statement of prosecutions under the Indian Mines Act, 1901, and Indian Penal Code during the year 1923.

Province.	District.	Number of prosecutions.	Number of persons prosecuted.	Number convicted.	Numbers of rules and sections of the Act contravened.	REMARKS.
Bengal	Burdwan	1	2	2	Section 20, Rules 2 and 22 of Notification No. 864—68-20, dated the 10th March 1904 and Rule 2 of Government of Bengal, Notification No. 3970-Com., dated the 28th August 1918.	
	Do.	1	2	2	Section 20, Rule 12 of Notification No. 864—68-20, dated the 10th March 1904.	
	Do.	4	7	5	Section 20, Rule 1 of Notification No. 11793—103, dated the 30th December 1908, as amended by Notifications No. 5072—113, dated the 1st July 1916, No. M-205—7, dated the 13th September 1920, and No. M-498, dated the 29th June 1922.	Two accused were acquitted.
	Do.	1	1	..	Section 21, Special Rules 15 and 21	Case dismissed.
	Do.	1	1	1	„ „ „ Rule 47.	
	Do.	1	1	..	„ „ „ „ 46	Accused absconded.
	Do.	1	..	..	„ „ „ „ 4	Case withdrawn.
	Bhagalpur	1	3	..	Section 20, Rule 1 of Notification No. 11793—103, dated the 30th December 1908, as amended by Notifications No. 5072—113, dated the 1st July 1916, No. M-205—7, dated the 13th September 1920, and No. M-498, dated the 29th June 1922.	Case withdrawn.
	Gaya	2	3	..	Do. do. do.	One accused could not be traced. Cases against the other two accused were withdrawn.
	Hazaribagh	2	2	..	Do. do. do.	Case against one accused is pending.
Bihar and Orissa.	Manbhum	6	9	8	Do. do. do.	One accused died.
	Do.	2	2	2	Section 22 (1) (d).	
	Do.	1	2	2	Section 20, Rules 3 and 7 of Notification No. 864—68-20, dated the 10th March 1904.	
	Do.	1	1	1	Section 13 (1).	
	Do.	1	1	1	Section 20, Rule 12 of Notification No. 864—68-20, dated the 10th March 1904.	
	Do.	1	2	2	Section 20, Rules 3 and 19 of Notification and Rule 3 of Bihar and Orissa Government Notification No. 11761-M., dated the 23rd August 1918.	
	Do.	1	1	1	Indian Electricity Rules, 1922.	
	Do.	1	1	1	Section 21, Special Rules 3, 5 and 6.	

## APPENDIX III.

Statement of prosecutions under the Indian Mines Act, 1901, and Indian Penal Code during the year 1923—*contd.*

Province.	District.	Number of prosecutions.	Number of persons prosecuted.	Number convicted.	Numbers of rules and sections of the Act contravened.	REMARKS.
Bihar and Orissa	Manbhum .	1	3	3	Section 21, Special Rule 4.	<i>Accused absconded.</i>
	Do. .	1	1	1	" " " Rules 61 and 96 .	
	Do. .	1	2	2	" " " Rule 4.	
Central vinces.	Balaghat .	1	2	2	Section 20, Rules 14 and 15 of Notification No. 6436-152, dated the 2nd September 1911.	<i>One accused was acquitted</i>
	Chanda .	1	2	1	Section 20, Rule 3 of Notification No. 864-68-20, dated the 10th March 1904.	
	Chhindwara .	1	3	3	Section 20, Rules 1 (a), 3 and 4 (a) of Notification No. 864-68-20, dated the 10th March 1904, and Rules 2 and 3 of Notification No. 11793-103, dated the 30th December 1908, as amended by Notifications No. 5072-113, dated the 1st July 1916, No. M.-205-7, dated the 13th September 1920, and No. M.-498, dated the 29th June 1922.	
	Jubbulpore .	1	2	2	Section 20, Rule 1 of Notification No. 11793-103, dated the 30th December 1908, as amended by Notifications No. 5072-113, dated the 1st July 1916, No. 205-7, dated the 13th September 1920, and No. M.-498, dated the 29th June 1922.	
	Narsinghpur	1	2	2	Section 304, Indian Penal Code.	
Madras . .	Nilgiris .	1	1	1	Sections 32 and 304. Indian Penal Code.	<i>One accused was acquitted.</i>
Rajputana .	Ajmer-Merwara.	1	2	1	Do. do. do. do. .	

# **APPENDIX IV.** **MISCELLANEOUS.**

## **Statement No. 1.**

### List of Inspection Circles.

No. 1 Circle.	No. 2 Circle.
1. All mines in Baluchistan. 2. All mines in Bihar and Orissa except mines in the district of the Sonthal Parganas and such mines in the district of Manbhum as lie west of a line drawn from mile 175 on the Bengal Nagpur Railway to mile 169 on the Grand Trunk Road and continued in a straight line across the district. 3. All mines in the North-West Frontier Province. 4. All mines in the Punjab. 5. All mines in Rajputana.	1. All mines in Assam. 2. All mines in Bengal. 3. Such mines in Bihar and Orissa as lie in the district of the Sonthal Parganas and in the district of Manbhum east of a line drawn from mile 175 on the Bengal Nagpur Railway to mile 169 on the Grand Trunk Road and continued in a straight line across the district. 4. All mines in Bombay. 5. All mines in Burma. 6 All mines in the Central Provinces. 7. All mines in Madras.

## **Statement No. 2.**

Names of persons to whom first and second class certificates to manage a coal mine were granted during the year 1923.

(a) Certificates granted to holders of English certificates of competency.

### FIRST CLASS.

NAME.	No. of Indian certificate.	Date of Indian certificate.	No. of English certificate.	Date of English certificate.
Barnard, Robert . . . .	293	19th February 1923 . . . .	896	12th June 1895.
Cunningham, John Gough . . . .	294	Ditto . . . .	978	12th July 1921.
Marshall, James . . . .	295	Ditto . . . .	1143	12th August 1922.
Taylor, James Holmes . . . .	296	Ditto . . . .	883	12th February 1921.
Caldwell, George Seddon . . . .	297	17th May 1923 . . . .	1895	25th June 1901.
Thomson, John Moore . . . .	298	31st July 1923 . . . .	885	12th February 1921.
Cochrane, Arthur . . . .	299	18th December 1923 . . . .	584	27th January 1919.
Emmerson, Thomas Humble . . . .	300	Ditto . . . .	376	27th July 1917.
Erskine, James . . . .	301	Ditto . . . .	834	11th August 1920.
Galbraith, James . . . .	302	Ditto . . . .	1276	3rd February 1923.
Moyes, Eric Milne . . . .	303	Ditto . . . .	975	11th May 1921.
Thomas, Evan Owen . . . .	304	Ditto . . . .	1161	12th August 1922.

**Statement No. 2—*contd.***

(b) Certificates of competency.

Name.	No. of certificate.	Date of certificate.	REMARKS.
Mack, Alexander . . . . .	155	16th May 1923.	
Starling, Robert Edwin Macnevin . . . . .	156	Ditto.	
Bhattacharjee, Tarapada . . . . .	157	Ditto.	
Penman, Robert Brown . . . . .	158	Ditto.	
Gittings, Harry . . . . .	159	Ditto.	
Bose, Sudhindra Narayan . . . . .	160	Ditto.	
Asheroft, Frederick Joshua . . . . .	161	Ditto.	
Roy Chowdhury, Abola Bandhu . . . . .	162	Ditto.	
Deb, Sris Chandra . . . . .	163	Ditto.	
Stewart, William . . . . .	164	Ditto.	
Ghosh, Niranjana . . . . .	165	Ditto.	
McCulloch, John . . . . .	166	Ditto.	

## SECOND CLASS.

Name.	No. of Indian certificate.	Date of Indian certificate.	No. of English certificate.	Date of English certificate.
Challenor, Thomas . . . .	26	18th December 1923 .	1139	30th July 1919.

**APPENDIX IV—contd.**  
**MISCELLANEOUS—contd.**

**Statement No. 2—concl'd.**

Names of persons to whom first and second class certificates to manage a coal mine  
were granted during the year 1923—concl'd.

(b) Certificates of competency.

**SECOND CLASS.**

Name.	No. of certificate.	Date of certificate.	REMARKS.
Chatterjee, Bejoy Krishna . . . . .	305	16th May 1923.	
Roy Chowdhury, Sunil Krishna . . . . .	306	Ditto.	
Sen, Profulla Chandra . . . . .	307	Ditto.	
Bose, Jitendra Cumar . . . . .	308	Ditto.	
Chatterjee, Surendra Nath . . . . .	309	Ditto.	
Bhattacharyya, Indu Bhusan . . . . .	310	Ditto.	
Sinha, Sarat Chandra . . . . .	311	Ditto.	
Sui, Sorabji Hormasji . . . . .	312	Ditto.	
Sen, Santo Jyoti . . . . .	313	Ditto.	
Mukherjee, Sambhu Nath . . . . .	314	Ditto.	
Sinha, Jatindra Mohan . . . . .	315	Ditto.	
Mitra, Manmatha Nath . . . . .	316	Ditto.	
Das, Dharendra Nath . . . . .	317	Ditto.	
Chatterjee, Sanat Kumar . . . . .	318	Ditto.	
Bhattacharjee, Nalini Kanta . . . . .	319	Ditto.	
Ghosh, Sakti Kinkar . . . . .	320	Ditto.	
Ferguson, James Arthur . . . . .	321	Ditto.	
Roy, Kishori Mohan . . . . .	322	Ditto.	
Banerjee, Hom Chandra . . . . .	323	Ditto.	
Chatterjee, Hari Sadhan . . . . .	324	Ditto.	
Mittra, Manindra Chandra . . . . .	325	Ditto.	
Ghose, Prokash Chandra . . . . .	326	Ditto.	
Sinha Roy, Kamala Kinkar . . . . .	327	Ditto.	
Mukherjee, Naranath . . . . .	328	Ditto.	
Mitter, Kalipada . . . . .	329	Ditto.	
Bagchi, Benode Behary Nath . . . . .	330	Ditto.	
Dey, Kiron Chandra . . . . .	331	Ditto.	
Ghosh, Pashupati . . . . .	332	Ditto.	
Bhaduri, Nripendra Nath . . . . .	333	Ditto.	
Banerjee, Bibhuti Bhusan . . . . .	334	Ditto.	
Chatterji, Mrityunjoy . . . . .	335	Ditto.	
Bose, Kali Krishna . . . . .	336	Ditto.	
Bose, Rajendra Nath . . . . .	337	Ditto.	
Acharyya, Jnanada Prosad . . . . .	338	Ditto.	
Chowdhury, Rajendra Lal . . . . .	339	Ditto.	

APPENDIX IV—*contd.*MISCELLANEOUS—*contd.*

## Statement No. 3.

List of Universities and Colleges approved by the Governor-General in Council for the purposes of Rules 32 and 33 under the Indian Mines Act.

Name of Institution and Degree or Diploma.	Date.
University of Birmingham in respect of its Degree of B.Sc. in Mining and Diploma in Mining.	11th June, 1904.
University College of Bristol in respect of its Senior Diploma in Mining.	16th September, 1904.
University of Cambridge in respect of its Diploma in Mining Engineering.	6th June, 1905.
University of Durham in respect of its Degree of B.Sc. in Mining .	21st December, 1903.
Durham College of Science in respect of its Diploma in Mining .	29th June, 1904.
University of Glasgow in respect of its Degree and Diploma in Mining	28th September, 1904.
Glasgow and West of Scotland Technical College in respect of its Diploma in Mining.	28th June, 1904.
University of Leeds in respect of its Degree of B.Sc. in Mining and Diploma in Mining.	21st November, 1904.
University of London in respect of its B.Sc. Degree in Mining for Internal Students, subject to the Degree being endorsed by the University with a certificate of four months' practical experience in a mine.	9th June, 1905.
University of London in respect of its B.Sc. Degree in Mining for External Students, subject to the Degree being endorsed by the University with a certificate of four months' practical experience in a mine.	7th August, 1906.
Royal School of Mines in respect of its Associateship in Mining .	24th March, 1904.
University of Oxford in respect of its Diploma B. for Colliery Engineers (in Scientific Engineering and Mining subjects).	11th February, 1905.
University College of Sheffield in respect of its Diploma in Mining .	15th July, 1904.
University College of South Wales and Monmouthshire in respect of its Diploma in Mining.	19th April, 1904.
Wigan Mining and Technical College in respect of its Diploma in Mining.	26th August, 1904.
Bengal Engineering College, Sibpur, in respect of its Diploma in Mining.	22nd February, 1907.
Merchant Venturers' Technical College, Bristol, in respect of its Diploma in Mining Engineering.	5th October, 1905.
Victoria University of Manchester in respect of its Degree and Certificate of Mining.	14th February, 1906.
University College of Nottingham in respect of its Diploma in Mining Engineering.	28th March, 1906.
University of Sheffield in respect of its Degree of Bachelor of Engineering (Mining).	30th June, 1906.
Heriot-Watt College in respect of its certificate in Mining Engineering	16th January, 1908.
Calcutta University in respect of its Degree of Bachelor of Engineering in the Branch of Mining Engineering.	24th September, 1910.
Harvard University, Cambridge, Massachusetts, in respect of its Diploma in Mining Engineering.	22nd February, 1913.
Columbia University, New York, in respect of its Degree of Engineer of Mines.	13th March, 1915.
California University, United States of America, in respect of its Degree of Mining Engineer.	19th February, 1916.
Pittsburg University, United States of America, in respect of its Degree of Engineer of Mines.	19th February, 1916.
Leland Stanford Junior University, California, in respect of its Degree of Bachelor of Arts, in Geology and Mining.	10th August, 1918.
Carnegie Institute of Technology, Pittsburg, Pennsylvania, in respect of its Degree of B.Sc., in Mining Engineering	26th February, 1923.

APPENDIX IV—*contd.*MISCELLANEOUS—*contd.*

## Statement No. 4.

## BENGAL ENGINEERING COLLEGE.

## THE MINING CLASSES.

*Admissions to the Diploma Course in Mining at the Bengal Engineering College.*

THE Diploma Course covers two sessions, commencing yearly in April, and lasting till the examinations in the following March. (There is a vacation of about three months in August, September and October.) Six weeks of each session is spent at a camp of mine surveying in the colliery districts.

Two classes of students are admitted—

*Regular*—who need have no experience of mining.

*Special*—who have had about two years' previous experience of coal-mining (underground).

Admissions are made as follows:—

*Regular students.*—Age may not exceed 20 on January 1st of the year of admission—

A.—Through a special preparatory course of one year's duration at the Bengal Engineering College. Admissions at the beginning of February.

B.—Through the Sub-Overseer classes (a two years' course) at Dacca, Burdwan, Rajshahi and Pabna in Bengal; Patna in Bihar and Orissa.

*Special students*—

C.—Direct from the mines to the Mining classes without passing through either A or B. Admissions at the beginning of April. Applications must be made by 1st March accompanied by certificates from the colliery managers under whom the candidate has served, showing the period and nature of his employment underground.

*Admission qualifications to A, B and C*—

The passing of the Matriculation Examination, the Junior Cambridge Examination, the Examination held at the end of the supplementary course for elementary European schools, or equivalent.

The number that can be admitted is limited. The selection of candidates rests with the Principal who, all other things being equal, will prefer the younger of two candidates.

Scholarships awarded by the Bengal Government—

*For regular students*—

Scholarships of the following number and value are available for regular students admitted under A, these are awarded on the result of the examination held at the end of the preparatory course A:—

Two of Rs. 12 monthly.

Three „ 6 „

Stipends awarded by the Bihar and Orissa Government—

Two Boarding stipends of Rs. 15 monthly tenable for three years by poor and capable students of that Province. These are available in either the Mining or Mechanical and Electrical Engineering classes.

*For special students.*—Awarded by the Bengal Government—

Awarded on the result of the examination held at the end of the lectures given in the colliery districts by the Instructor in Mining—

One of Rs. 50 for Europeans.

One or two of Rs. 25 for Indians.

These amounts should be sufficient to maintain a special student resident at the college.

For further particulars apply for the Apprentice Department Circular.

T. H. RICHARDSON,

*Principal, Bengal Engineering College,  
Botanic Garden P. O.*

APPENDIX IV—*contd.*MISCELLANEOUS—*contd.*

## Statement No. 5.

## MINING INSTRUCTION IN THE COALFIELDS OF BENGAL AND BIHAR AND ORISSA.

THE full course covers a period of three years, and the following is an abstract of the syllabus :—

## First year—

- (1) Mathematics.
- (2) Elementary Science.

## Second year—

- (1) Elementary Mechanics.
- (2) Mechanical Drawing.
- (3) Elementary Mining and Surveying.

## Third year—

- (1) The Principles of Coal Mining.
- (2) Mechanical and Electrical Engineering of Collieries.

Copies of detailed syllabus may be obtained from the Secretary and the Lecturer.

A fee of Rs. 5 is payable by each student to the Mining Lecturer on the first registration of his name for the first or second year's course of lectures. The fee for the third year's course is Rs. 10. These fees are not returnable.

The class arrangements for all the courses will be arranged by the Lecturer on the night of enrolment. Students should enrol at the first meeting so that the class work may be commenced without delay.

The course of instruction will commence in the first week in September and end in the following May. The examination will be held in May. Candidates who pass the final examination will receive a certificate recording their success. No certificates will be given to candidates unless they attend the second and third years. No candidate will, however, be permitted to sit for the examination unless he has attended 50 per cent. of the lectures and received 40 per cent. of the marks allotted for home work.

During session 1923-24 lectures on Mathematics and Science will be delivered in Bengal on two nights each week ; in Bihar and Orissa lectures on all years of the course will be delivered.

The Mining Lecturer will also deliver in Bengal, during the session 1923-24 only, the series of lectures on the Principles of Mechanical Engineering of Coal Mines as laid down in the old course one night weekly. Only students who have qualified in other part of the old course will be admitted to this course.

*Lecture Centres.*

Bengal.  
Raniganj Lecture Hall.  
Sitarampur ditto.

Bihar and Orissa.  
Jharria Lecture Hall.  
Sijua ditto.

The following Local Committees have been appointed, 1923-24 :—

*Bengal Coalfields.*

Raniganj Centre.  
Mr. J. H. Lang, Chairman.  
" P. S. Keelan (Charanpur).  
" A. T. Creet (Kalipahari).  
" W. J. Rees (Raniganj).  
Babu Promothonath Hazra (Toposi).  
" Purna Chandra Bagchi (Kalipahari).  
" S. Chaudhuri (Jamehari).

Sitarampur Centre.  
Mr. J. H. Lang, Chairman.  
" J. B. Wardlaw (Dishergarh).  
" W. S. Elphinstone (Asansol).  
" W. Weir (Kulti).  
Babu U. N. Mondal (Dishergarh).  
" S. N. Banerjee (Faridpur).  
" S. N. Ghosh (Barakar).



## APPENDIX IV—contd.

## MISCELLANEOUS—contd.

## Statement No. 5—contd.

## MINING INSTRUCTION IN THE COALFIELDS OF BENGAL AND BIHAR AND ORISSA.

*Bihar and Orissa Coalfields.*

Jharia Centre.	Sijua Centre.
Mr. D. Penman, Chairman.	Mr. D. Penman, Chairman.
„ G. Jones, Lecturer.	„ G. Jones, Lecturer.
„ R. G. M. Bathgate (Jamadoba).	„ A. A. Agabeg (Sijua).
„ J. Murray (Kustore).	„ J. T. Mackenzie (Katras).
„ J. B. Argyle (Lodna).	„ H. M. Bull (Bansjora).
„ R. Barrowman (Standard Coal Co., Jharia).	„ G. C. Leach (Sijua).
„ Narendra Nath Sarkar (South Kujama, Jharia).	Babu Trikundas Doyal (Bullihari Colliery, Kusunda P.O.).
„ S. M. Chatterjee (Kalithan Suratand, Jharia).	Mr. Meghji Bhimji Relia (Angrapathra).

[The Mining Education Advisory Board desire that Colliery Managers will kindly publish this information in their Collieries. An appeal is also made to them to support the lectures by seeing that members of their colliery staff, who are suitable, take advantage of the lectures and attend them regularly.]

T. H. RICHARDSON,

*Secretary, Mining Education Advisory Board.*

BENGAL ENGINEERING COLLEGE, BOTANIC GARDEN P. O.,

*The 18th July 1923.*

## SYLLABUS OF THE COURSE OF INSTRUCTION.

*First Year Course.*

1. *Mathematics*.—Arithmetic and Algebra up to simple equations. Mensuration and use of squared paper. Trigonometry up to solution of triangles.

2. *Elementary Science*.—*Physics*.—Volume of displacement, Balances, Density, Specific gravity bottle, Fluid pressure, Hydrometer, Syphon, Barometer, Ideas of forces, Equilibrium of three forces, Centres of gravity, Fraction, Thermometer, Expansion due to heat, Latent heat of steam, Properties of solids, liquids and gases, Boyle's Law, Hydrostatics, Elements of Electricity and Magnetism, Electrical units.

*Chemistry*.—Atomic theory, elements, compounds, mixtures, acids, bases, composition of the atmosphere and of gases met with in mines.

*Second Year Course.*

1. *Mechanics*.—Units of Mass, Length and time, Levers, Pulleys, Wedges, Gearing, Simple machines, Equilibrium, Units of work and energy, Horse-power, Stress and strain, Design and headgears, Strength of ropes, chains, boilers, etc. The elementary principles of Hydraulics.

2. *Mechanical Drawing*.—Conventional signs, Construction of Scales, Nuts, Bolts, Screw threads, simple parts of machines, Engines and Pumps. The elementary principles of Geometry.

3. *Mining Surveying*.—Use of pens, scales and protectors, Surveying by means of the chain only. The Miner's Dial, Loose needle surveying, Fixed needle surveying, Levelling, Field books, Contouring. The use of the Plane Table. The Theodolite and its uses, Plotting by co-ordinates. Setting out and alignment. The adjustment of instruments.

*Third Year Course.*

1. *The Principles of Coal Mining*.—(1) *Geology*.—General structure of the earth's crust, igneous and aqueous rocks; definitions of outcrop, dip, strike, fault, roll, wash-out and dyke,

APPENDIX IV—*contd.*MISCELLANEOUS—*contd.*Statement No. 5—*concl'd.*

etc. ; recording geological observations ; reading a geological map ; description of the Indian coal-bearing rocks ; composition and properties of coal ; commercial values of coal.

(2) *Exploration*.—Prospecting, trial shafts and trenching, advantages of boring, methods of boring, driving through faults, uses of boreholes in mines, etc.

(3) *Breaking ground*.—Common tools, storage and use of explosives, electric fuses, machine drills, coal-cutting machines.

(4) *Sinking*.—Site of colliery, position of inclines and shafts, their excavation and shape, apparatus used in sinking, lining shafts, arrangements at top of sinking shafts, brief mention of special methods of sinking.

(5) *Methods of working*.—Quarrying, advantages of bench work, disposal of soil, shaft pillars, pillar and gallery method, working thick seams in stages, extraction of pillars, panels, brief description of long wall and chambering methods.

(6) *Supporting*.—Props and lids, bars, chocks or cogs, square sets, special timbering in loose ground, arching, steel girders, packing, dry and hydraulic stowing.

(7) *Mine gases*.—Their experimental preparation by chemicals and illustration of their physical and physiological properties, their chemical composition, methods of detecting explosions, spontaneous combustion of coal, dangers of coal dust.

(8) *Ventilation*.—Ascensional currents, currents induced by the heat of steam or furnace, mine fans, friction of air in mines, theory of splitting the air, calculations of ventilating pressure, etc., coursing the air, measurement of quantity of air, use of anemometer, watergauge, thermometer and barometer, reserving the air current.

(9) *Safety lamps*.—Principle of the safety lamps, Sir Humphrey Davy's experiments, types of safety lamps, firedamp detectors.

2. *The Principles of Mechanical and Electrical Engineering of Coal Mines*.—(1) *Applied Mechanics*.—The practical application of the principles taught in the 1st and 2nd years.

(2) *Steam, Electricity and Compressed Air*.—Theory of steam boilers and their fittings, the steam engine, the dynamo, the electric motor, electric lighting and airing, the air compressor.

(3) *Winding*.—Types of winding engines and description of parts, calculation of the dimensions of winding engines, strength of ropes and chains, detaching hooks, over-winding prevention devices, rope cappings, care and examination of ropes, buckets, cages, guide ropes.

(4) *Pumping*.—The lift pump, the force pump, sinking pumps, pumps with positive valve motion, the pulsometer, turbine pumps, calculations of the dimensions of pumps, methods of supporting pumps and pipes, strength of pipes, pipe joints, dams to hold back water.

(5) *Hauling*.—Tramways, tubs, hand tramming, horse haulage, self-acting inclines, locomotives, single rope haulage, main and tail rope haulage, endless rope or chain haulage, calculations of the dimensions of hauling engines, ropes, etc., capping of haulage ropes, couplings, haulage clips, etc., signalling.

(6) *Surface arrangements*.—Headframes and pulleys, receiving frames, keds, arrangements of roads on pit bank, tipplers, simple screening and sizing, railway sidings, aerial ropeways.

(7) Simple treatment of coking and bye-product ovens.

T. H. RICHARDSON,

*Secretary, Mining Education Advisory Board.*

APPENDIX IV—*contd.*MISCELLANEOUS—*contd.*

## Statement No. 6.

## MINING INSTRUCTION IN BIHAR AND ORISSA.

*(The Mining Education Advisory Board desire that Colliery Managers will kindly publish this information in their collieries. An appeal is also made to them to support the lectures by seeing that members of their colliery staff, who are suitable, take advantage of the lectures and attend them regularly.)*

The full course covers a period of three years and the following is an abstract of the syllabus :

*First year.*—(1) Mathematics, (2) Elementary Science.

*Second year.*—(1) Elementary Mechanics, (2) Mechanical Drawing, (3) Elementary Mining Surveying.

*Third year.*—(1) Mining Surveying, (2) The Principles of Coal Mining, (3) Mechanical and Electrical Engineering of Collieries.

A fee of Rs. 5 (five rupees) is payable by each student to the Mining Lecturer on the first registration of his name for the first or the second year's course of lectures. The fee for the third year's course is Rs. 10. These fees are not returnable.

*Programme for Session 1923-24.*

During session 1923-24 instruction in all the years of the course will be provided. Lectures in each subject will be delivered each week.

*Lecturer.*

Mr. Griffith Jones, B.Sc., first class certificated Colliery Manager and Surveyor.

*Assistant Lecturers.*

N. N. Sen, L.M.E., and

All students should enrol as follows :—

*Jharia Lecture Hall.*—Monday, September 3, at 5 P.M. and Thursday, September 6, at 5 P.M.

*Sijua Lecture Hall.*—Tuesday, September 5, at 5 P.M. and Friday, September 7, at 5 P.M.

The class arrangements for all the courses will be arranged by the lecturers on the enrolling nights. Students should enrol during the first week so that the class work may be commenced without delay.

The course of instruction will commence in the first week in September and end in the following May. The examination will be held in May. No certificate shall be given to candidates unless they pass the 2nd and 3rd year's examinations. No candidate will, however, be permitted to sit for the examination unless he has attended 50 per cent. of the lectures and received 40 per cent. of the marks allotted for home work.

The following Local Committees have been appointed :—

## JHARIA COALFIELD.

Jharia Centre.	Sijua Centre.
Mr. D. Penman, Chairman.	Mr. D. Penman, Chairman.
„ G. Jones, Lecturer.	„ G. Jones, Lecturer.
„ R. G. M. Bathgate (Jamadoba).	„ A. A. Agabeg (Sijua).
„ J. Murray (Kustore).	„ R. Heron (Bhalgora, Jharia P. O.).
„ J. B. Argyle (Lodna).	„ H. M. Bull (Bansjora).
„ R. Barrowman (Standard Coal Company, Jharia)	„ G. C. Leach (Sijua P. O.)
„ Narendra Nath Sarkar (South Kujama, Jharia).	Babu Trikundas Doyal (Bullihari Colliery, Kusunda P. O.).
„ S. M. Chatterjee (Kalithan Suratand, Jharia).	Mr. Meghji Bhimji Relia (Angfapathra).

APPENDIX IV—*contd.*MISCELLANEOUS—*contd.*Statement No. 6—*contd.*

## MINING INSTRUCTION IN THE COALFIELDS OF BIHAR AND ORISSA.

## SYLLABUS OF THE COURSE OF INSTRUCTION.

*First Year Course.*

1. *Mathematics*.—Arithmetic and Algebra up to simple equations. Mensuration and use of squared paper. Trigonometry—up to solution of Triangles.

2. *Elementary Science*.—*Physics*.—Volume of displacement, Balances, Density, Specific gravity bottle, Fluid pressure, Hydrometer, Syphon, Barometer, Ideas of forces, Equilibrium of three forces, Centres of gravity, Fraction, Thermometer, Expansion due to heat, Latent heat of steam, Properties of solids, Liquids and gases, Boyle's Law, Hydrostatics, Elements of electricity and Magnetism, Electrical units.

*Chemistry*.—Atomic Theory, Elements, Compounds, mixtures, acids, bases, composition of the atmosphere and of gases met with in Mines.

*Second Year Course.*

1. *Mechanics*.—Units of Mass, Length and time, Levers, Pulleys, Wedges, Gearing Simple Machines, Equilibrium, Units of work and energy, Horse Power, Stress and Strain, Design and headgears, Strength of ropes, chains, boilers, etc. The elementary principles of hydraulics.

2. *Mechanical Drawing*.—Conventional signs, Construction of Scales, Nuts, Bolts, Screw threads, Simple parts of machines, Engines and Pumps. The elementary principles of geometry.

3. *Elementary Mining Surveying*.—Use of pens, Scales and Protectors, Surveying by means of the chain only. The plotting of simple Surveys and Levelling sections. The Miner's Dial. Loose needle surveying.

*Third Year Course.*

1. *Mining Surveying*.—Fixed needle surveying, Levelling, Field books, Contouring. The use of the Plane Table. Theodolite and its uses, Plotting by co-ordinates. Setting out and alignment. The adjustment of instruments.

2. *The Principles of Coal Mining*.—(1) *Geology*.—General structure of the earth's crust, igneous and aqueous rocks; definitions of outcrop, dip, strike, fault, roll, wash-out and dyke, etc., recording geological observations reading a geological map, description of the Indian coal-bearing rocks, composition and properties of coal, commercial values of coal.

(2) *Exploration*.—Prospecting, trial shafts and trenching, advantages of boring, methods of boring, driving through faults, uses of boreholes in mines, etc.

(3) *Breaking ground*.—Common tools, storage and use of explosives, electric fuses, machine drills, coal-cutting machines.

(4) *Sinking*.—Site of colliery position of inclines and shafts, their excavation and shape, apparatus used in sinking, lining shafts, arrangements at top of sinking shaft, brief mention of special methods of sinking.

(5) *Methods of working*.—Quarrying, advantages of bench work, disposal of soil; shaft pillars, pillar and gallery method, working thick seams in stages, extraction of pillars, panels, brief description of long wall and chambering methods.

(6) *Supporting*.—Props and lids, bars, chocks or cogs, square sets, special timbering in loose ground, arching, steel girders, packing, dry and hydraulic stowing.

(7) *Mine gases*.—Their experimental preparation by chemicals and illustration of their physical and physiological properties, their chemical composition, methods of detecting explosions, spontaneous combustion of coal, dangers of coal dust.

(8) *Ventilation*.—Ascensional currents, currents induced by the heat of steam or furnace, mine fans, friction of air in mines, theory of splitting the air, calculations of ventilating pressure, etc., coursing the air, measurement of quantity of air, use of anemometer, watergauge, thermometer and barometer, reversing the air current.

(9) *Safety lamps*.—Principle of the safety lamps, Sir Humphrey Davy's experiments, types of safety lamps, firedamp detectors.

3. *The Principles of Mechanical and Electrical Engineering of Coal Mines—*

(1) *Applied Mechanics*.—The practical application of the principles taught in the 1st and 2nd years.

APPENDIX IV—*contd.*MISCELLANEOUS—*contd.*Statement No. 6—*concl'd.*

(2) *Steam electricity and compressed air.*—Theory of steam boilers and their fittings, the steam engine, the dynamo, the electric motor, electric lighting and airing, the air compressor.

(3) *Winding.*—Types of winding engines and description of parts, calculation of the dimensions of winding engines, strength of ropes and chains, detaching hooks, over-winding prevention devices, rope cappings, care and examination of ropes, buckets, cages, guide ropes.

(4) *Pumping.*—The lift pump, the force pump, sinking pumps, pumps with positive valve motion, the pulsometer, turbine pumps, calculations of the dimensions of pumps, methods of supporting pumps and pipes, strength of pipes, pipe joints, dams to hold back water.

(5) *Hauling.*—Tramways, tubs, hand tramping, horse haulage, self-acting inclines, locomotives, single rope haulage, main and tail rope haulage, endless rope or chain haulage, calculations of the dimensions of hauling engines, ropes, etc., capping of haulage ropes, couplings, haulage clips, etc., signalling.

(6) *Surface arrangements.*—Headframes and pulleys, receiving frames, keps, arrangements of roads on pit bank, tipplers, simple screening and sizing, railway sidings, aerial ropeways.

(7) Simple treatment of coking and bye-product ovens.

D. PENMAN,

*Assistant Secretary,*

*Mining Education Advisory Board.*

DEPARTMENT OF MINES, DHANBAD :

*The 1st August 1923.*

## Statement No. 7.

## INDIAN MINES ACT, 1901.

## EXAMINATION FOR COLLIERY MANAGERS' CERTIFICATES OF COMPETENCY.

*First class.*

## GEOLOGY AND MINING.

19th February 1923.

10 a.m. to 1-30 p.m.

NOTE.—The questions should not be copied. They may be answered in any order.

1. An extensive property is adjacent to a river, and contains a coal seam, 16' thick, dipping at 1 in 5, and lying at a depth of 500 ft. Sketch and describe how you would develop the property on modern lines. What are the governing factors in selecting the sites of the shafts? (25).

2. In the first working of a coal seam 24 ft. thick, and at a depth of 400 ft. what precautions would you adopt to avoid "creep" and "thrust"? State how you would extract the pillars, and the precautions necessary when setting and withdrawing timber. Illustrate your answer by sketches. (25).

3. Give, with examples, an account of the character and mode of occurrence of the intrusive igneous rocks in the Indian coal-fields. How do they affect the working of a mine? (15).

4. What in your opinion are the best explosives now being used in Indian coal mines :—

(a) For blasting coal ;

(b) For blasting stone ?

Give the general characteristics and composition of each.

Show by dimensioned sketches how you would arrange the shot holes, and the order of firing the shots in :—

(a) An undercut gallery in coal ;

(b) A stone drift. (15).

5. A diamond borehole has passed through a friable stratum, 20 ft. thick, at a depth of 1,000 ft. Small pieces of stone keep dropping into the hole from this stratum, tending to jam the rods. How would you overcome the difficulty so as to continue boring ? (15).

6. Describe what you consider to be the best method of supporting the sides of a shaft, 18 ft. diameter, which is being sunk to depth of 1,200 ft. through comparatively soft strata ? (15).

APPENDIX IV—*contd.*MISCELLANEOUS—*contd.*Statement No. 7—*contd.*

## INDIAN MINES ACT, 1901.

## EXAMINATION FOR COLLIERY MANAGERS' CERTIFICATES OF COMPETENCY.

*First Class.*

## MANAGEMENT AND MINING LEGISLATION.

19th February 1923.

3 P.M. to 5 P.M.

NOTE.—The questions should not be copied. They may be answered in any order.

1. State briefly the General and Special Rules regarding "fencing". What would you consider to be a proper fence in each of the following circumstances?—

- (a) An abandoned quarry, 40 ft. deep, with perpendicular sides and full of water.
- (b) The top of a working shaft.
- (c) An abandoned shaft.
- (d) An area on the surface which was believed to be unstable through the extraction of pillars underground.
- (e) Underground galleries not in actual use. (10).

2. Write a report, not on any prescribed form, as to the condition of the mine, such as you might expect to be made by the undermanager to the manager at the end of the shift. (10).

3. When part of a mine has suddenly become dangerous, what are the requirements of the rules? (8).

4. Give in your own words the General Rules regarding machinery used for raising and lowering persons. (10).

5. Explain :—

What is meant by a "ventilating district", and "an adequate amount of ventilation"? What do you consider to be the maximum permissible percentages of :—firedamp, blackdamp, and white-damp in the air consistent with "adequate ventilation"? Where must safety lamps be used in a mine? (10).

6. Describe carefully the provision and arrangements you would make on a large colliery employing 1,000 persons, for the treatment and care of injured persons, and for their transport from the mine to the place of treatment. Give a dimensioned line drawing of a small hospital and dispensary to serve such a colliery. (12).

## VENTILATION, EXPLOSIONS, UNDERGROUND FIRES AND INUNDATIONS.

20th February 1923.

10 A.M. to 1 P.M.

NOTE.—The questions should not be copied. They may be answered in any order.

1. Review briefly the possible causes of spontaneous combustion in mines. What steps would you take to guard against it? (12).

2. Describe briefly the various improvements made in the construction and design of the safety lamp since it was first brought into use in coal mines. What parts of the safety lamp are most likely to get out of order? (12).

3. Show by means of the usual symbols how you would ventilate the workings on the annexed plan. Indicate on the plan the main haulage roads. (15).

4. Explain the advantages to be obtained by "splitting" the air. If half an inch of W. G. causes 30,000 cu. ft. of air per minute to flow through an airway 1,000 ft. long, what quantity of air will, with the same W. G., pass through :—

- (a) Two similar airways connected in parallel.
- (b) Three similar airways connected in parallel? (12).

5. Under what conditions is coal dust capable of causing or aiding an explosion in a mine? What precautions are advisable? (12).

6. Describe, with sketches, the precautions you would take in a sinking shaft in which firedamp is being given off freely. (12).

APPENDIX IV—*contd.*MISCELLANEOUS—*contd.*Statement No. 7—*contd.*

## INDIAN MINES ACT, 1901.

## EXAMINATION FOR COLLIERY MANAGERS' CERTIFICATES OF COMPETENCY.

*Second Class.*

## VENTILATION, EXPLOSIONS, UNDERGROUND FIRES AND INUNDATIONS.

27th February 1923.

10 A.M. to 1 P.M.

NOTE.—The questions should not be copied. They may be answered in any order.

1. What is the object of mine ventilation? What is natural ventilation and how is it brought about? (10).

2. Describe the following and explain their use :—

- (a) A water gauge.
- (b) An anemometer.
- (c) An air crossing.
- (d) A stopping.
- (e) An air door.
- (f) A brattice.

(12).

3. If an airway is 5'-6" high, 9'-3" wide, and 2,584 feet long, find :—

- (a) the rubbing surface in square feet ;
- (b) the sectional area ; and
- (c) the perimeter.

If the velocity of the air current is 250 ft. per minute, what is the quantity of air in cu. ft. per minute? (12).

4. Describe the characteristics of carbon monoxide and carbon dioxide. To what extent are they dangerous to life, and how can their presence be detected? (12).

5. If a fire stopping in a mine has collapsed, and gases are being emitted, how would you proceed to rebuild it with safety to those employed? (12).

6. On what principle does the safety lamp depend? Give a sketch of a safety lamp, and explain how it should be examined to find out if it is in proper order. What are the advantages and disadvantages of electric safety lamps? (12).

## SURVEYING, LEVELLING AND MENSURATION.

27th February 1923.

2-30 P.M. to 5 P.M.

NOTE.—The questions should not be copied. They may be answered in any order.

1. Describe fully how you would ascertain and record the levelling of the surface between two points, and mention the instruments you would require for the purpose. What are contour lines? (7)

2. Plot the following survey to a scale of 200 ft. to 1 inch :—

S. 72½ E.	460 Ft.
S. 51½ W.	790 Ft.
N. 25 W.	700 Ft.
N. 54½ W.	340 Ft.
N. 32½ E.	530 Ft.
S. 72 E.	290 Ft.
S. 31½ E.	370 Ft.

(10).

3. Explain in full detail the method of loose needle surveying. State its advantages and disadvantages. (6).

4. A stack of coal measures 180' × 90' at the base, 150' × 6' at the top, and is 20' high. Calculate the weight of coal in tons. Assume that the coal in the solid weighs 0.9 ton per cu. yd., and in the heap weighs 60 per cent. of the weight of the coal in the solid. (7).

5. Draw on your paper an irregularly bounded area. Show how you would set off triangles, etc., in order to make a chain survey. State how you would range in poles for the purpose of chaining a line across a valley. (7).

6. Explain in full detail how you would proceed if you were asked to find the position of a surface point exactly above a certain point underground (8).

APPENDIX IV—*contd.*MISCELLANEOUS—*contd.*Statement No. 7—*contd.*

## INDIAN MINES ACT, 1901.

## EXAMINATION FOR COLLIERY MANAGERS' CERTIFICATES OF COMPETENCY.

*Second Class.*

## MACHINERY.

28th February 1923.

10 A.M. to 2 P.M.

NOTE.—The questions should not be copied. They may be answered in any order.

1. A road dips at the rate of 1 in 3; find the tractive force necessary to draw up a train of tubs weighing 10 tons. Find the useful horsepower developed if the speed is 8 miles per hour. Assume that the combined coefficient of friction of the tubs and rope is  $1/56$ . (14).

2. A windlass has a barrel 10" in diameter, and the circle described by the handles is 4 ft. in dia. What weight can be raised with two men at each handle, each exerting 26 lbs. pressure? (12).

3. What is meant by :—

(a) An electrical conductor.

(b) An insulator.

(c) A dynamo.

(d) An electric motor.

(e) A fuse.

(f) A double pole switch? (12).

4. Sketch and describe fully a simple non-condensing steam engine with reversing gear. What is a compound steam engine? (14).

5. Sketch and describe the arrangements you would make for slinging a steam pump in a sinking shaft, 200 ft. deep, which is to be sunk to a depth of 300 ft. Assume that the maximum quantity of water will not be more than 7,000 gallons per hour. (14).

6. Enumerate the essential fittings on a vertical boiler. Why is the manhole oval in shape? What is the effect of sediment or incrustation forming in a boiler, and how may danger arise therefrom? (14).

## Statement No. 8.

## DEPARTMENT OF INDUSTRIES AND LABOUR.

## NOTIFICATION.

*Simla, the 14th April 1924.*

No. M.-498.—In exercise of the power conferred by section 20 of the Indian Mines Act, 1901 (VIII of 1901), the Governor General in Council is pleased to direct that the following further amendments shall be made in the rules published with the notification of the Government of India in the Department of Revenue and Agriculture, No. 864—68-20, dated the 10th March 1904, the same having been previously published as required by sub-section (3) of the said section, namely :—

After rule 54 of the said rules, the following heading and rules shall be inserted, namely :—

“ Rules for the examination and certification of underground sirdars.

Rule 55.—With effect from the first day of January 1926, no person shall, save as herein-after provided, be appointed to make the inspection required by sub-rule (a) of rule 4 unless he—

- (i) has within the preceding five years obtained a certificate from an authority and in a form to be prescribed by the Board of Examiners constituted under rule 28 to the effect that his powers of eyesight and hearing are such as to enable him to make the inspection efficiently and



**APPENDIX IV—contd.**  
**MISCELLANEOUS—contd**

**Statement No. 7—contd.**

**INDIAN MINES ACT, 1901.**

**EXAMINATION FOR COLLIERY MANAGERS' CERTIFICATES OF COMPETENCY.**

*First Class.*

**SURVEYING, LEVELLING AND MENSURATION.**

26th February 1923.

2-30 P.M. to 5 P.M.

NOTE.—The questions should not be copied. They may be answered in any order.

**1. Plot by rectangular co-ordinates the following survey:—**

A to 1	.	.	.	.	.	.	.	.	.	N. 50 W.	200 Ft.
1 to 2	.	.	.	.	.	.	.	.	.	N. 40 W.	250 Ft.
2 to 3	.	.	.	.	.	.	.	.	.	N. 55 E.	300 Ft.
3 to B,	.	.	.	.	.	.	.	.	.	S. 35 E.	370 Ft.

*Table.*

Cos. 50 : .6427  
Sin. 50 : .766

Cos. 55 : .5735  
Sin. 55 : .8191

Tan. 37 : .753  
Tan. 38 : .781

Cos. 40 : .766  
Sin. 40 : .6427

Cos. 35 : .8191  
Sin. 35 : .5735

Cos. 37 : .708  
Cos. 38 : .788

Calculate the bearing and length of the line joining A to B.

Check the result by plotting to a scale of 1" equal to 100 ft.

(10).

2. Describe how you would determine as accurately as possible the angle between the position taken up by the needle of a miners' dial and the true North. If no true North line was available how would you determine it, and how would you mark it out on the ground ? (8).

3. Draw a scale 3 inches long reading to tenths of an inch, and on it construct a vernier capable of reading to a hundredth part of an inch. (8).

4. Describe in detail the best method of levelling underground :—

(a) Where the dip of the strata is 1 in 2, and the seam is 8 ft. thick.

(b) Where the dip of the strata is 1 in 30, and the seam is 20 ft. thick.

Do you consider it would be an advantage to have levels recorded on colliery plans ? What datum would you use ? (8).

5. Draw a hexagon with sides two inches long. Reduce the figure to a triangle and find the area. Check the area of the triangle by calculating the area of the hexagon. (8).

6. How would you test the accuracy of a miners' dial, and a dumpy level ? (8).

**MACHINERY.**

21st February 1923.

10 A.M. to 2 P.M.

NOTE.—The questions should not be copied. They may be answered in any order.

1. (a) What precautions are necessary in fitting a white metal capping to a winding rope ?

(b) Sketch and describe a detaching hook and the operation of re-attaching the rope after an overwind. (15).

2. What are the chief advantages of transmitting electricity at high pressure ?

What voltages are most suitable for :—

(a) Surface machinery.

(b) Underground machinery ?

If the source of supply is 3,300 volts A. C., and the power required at a motor is 550 volts D. C., state what apparatus is necessary. (15).

3. Discuss the relative merits of electricity and compressed air for driving coal cutting machines. If electrical power is employed show by dimensioned sketches the lay-out of cables and gate end boxes to supply two machines. (15).

4. Calculate the size of a coupled winding engine to raise 500 tons of coal in 8 hours from a depth of 900 ft. Assume a steam pressure of 100 lbs. per sq. inch, an average winding speed of 25 ft. per second, and that the ropes are balanced. (15).

APPENDIX IV—*contd.*MISCELLANEOUS—*contd.*Statement No. 7—*contd.*

## INDIAN MINES ACT, 1901.

## EXAMINATION FOR COLLIERY MANAGERS' CERTIFICATES OF COMPETENCY.

*First Class.*MACHINERY—*contd.*

5. If you had occasion to indent for an electrically driven centrifugal pump to deal with 30,000 gallons per hour against a head of 600 ft., what are the chief points you would put before the makers? (15).

6. If 200 tons of coal are to be hauled in 10 hours up an incline half a mile long at a gradient of 1 in 6, show by separate calculations the H. P. of engine required for direct and endless haulage, respectively. (15).

*Second Class.*

## GEOLOGY AND MINING.

26th February 1923.

10 A.M. to 1-30 P.M.

NOTE.—The questions should not be copied. They may be answered in any order.

1. Describe, with sketches, the different kinds of faults encountered in coal mining. If a fault met with in a level throws out all the coal, how can you tell whether the coal is thrown up or down? If it is thrown up, in what direction would you drive to find the coal supposing the dip of the seam to be 1 in 6 to the South? (20).

2. What is a detonator? describe it and explain how it is used. How would you charge and fire shots in a sinking shaft? (15).

3. How would you ensure that a shaft was being sunk plumb; and how would you accurately measure the depth of a deep shaft? (15).

4. A seam of coal has been worked by driving galleries, 10 ft. high and 12 ft. wide, on the floor, and the total thickness of the seam is 20 ft. with a moderately good shale roof. Describe, with sketches, how you would work the roof coal and extract the pillars. (20).

5. It is expected to find the outcrop of a coal seam under 50 ft. of cover. Describe how you would prove the seam, and the tools you would use for putting down a borehole. (15).

6. An underground dam has to be put in to resist a head of 150 ft. of water in a roadway 14 ft. wide by 10 ft. high. What circumstances should be taken into consideration in selecting the site for the dam. Show by sketches how you would construct the dam, and state what materials you would use. (15).

## MANAGEMENT AND MINING LEGISLATION.

26th February 1923.

3 P.M. to 5 P.M.

NOTE.—The questions should not be copied. They may be answered in any order.

1. State the necessary qualifications of the manager of a colliery having an average output of 2,000 tons per month, and give a brief outline of his duties as set out in the Special Rules. (8).

2. Assume that you have been appointed manager of a colliery with an average output of 2,000 tons per month, and that there is one winding shaft, one haulage incline, two carrying inclines, and one quarry. Assume that you have not previously worked in the colliery, and explain briefly to what points you would pay special attention in your first round of inspection. (8).

3. State the duties of a chargeman in a sinking shaft as set out in the Special Rules. (8).

4. What are the precautions against accidents which in accordance with the General and Special Rules require to be taken when :—

(a) A shot hole is being charged.

(b) A shot is about to be fired.

(c) A shot misses fire.

(d) A shot is about to be fired in a working which has approached within eight feet of another working? (10).

5. Describe an efficient system of registering each workman underground in each shift. (8).

6. Describe the construction you would adopt for the top of a well for drinking water, to comply with the following requirements :—

(a) The safety and convenience of persons drawing water.

(b) The prevention of the pollution of the well by surface water and refuse.

Your answer should be illustrated by sketches.

(8).

APPENDIX IV—*contd.*MISCELLANEOUS—*contd.*Statement No. 7—*contd.*

## INDIAN MINES ACT, 1901.

## EXAMINATION FOR COLLIERY MANAGERS' CERTIFICATES OF COMPETENCY.

*Second Class.*

## VENTILATION, EXPLOSIONS, UNDERGROUND FIRES AND INUNDATIONS.

27th February 1923.

10 A.M. to 1 P.M.

NOTE.—The questions should not be copied. They may be answered in any order.

1. What is the object of mine ventilation? What is natural ventilation and how is it brought about? (10).

2. Describe the following and explain their use :—

- (a) A water gauge.
- (b) An anemometer.
- (c) An air crossing.
- (d) A stopping.
- (e) An air door.
- (f) A brattice.

(12).

3. If an airway is 5'-6" high, 9'-3" wide, and 2,584 feet long, find :—

- (a) the rubbing surface in square feet ;
- (b) the sectional area ; and
- (c) the perimeter.

If the velocity of the air current is 250 ft. per minute, what is the quantity of air in cu. ft. per minute ? (12).

4. Describe the characteristics of carbon monoxide and carbon dioxide. To what extent are they dangerous to life, and how can their presence be detected ? (12).

5. If a fire stopping in a mine has collapsed, and gases are being emitted, how would you proceed to rebuild it with safety to those employed ? (12).

6. On what principle does the safety lamp depend ? Give a sketch of a safety lamp, and explain how it should be examined to find out if it is in proper order. What are the advantages and disadvantages of electric safety lamps ? (12).

## SURVEYING, LEVELLING AND MENSURATION.

27th February 1923.

2-30 P.M. to 5 P.M.

NOTE.—The questions should not be copied. They may be answered in any order.

1. Describe fully how you would ascertain and record the levelling of the surface between two points, and mention the instruments you would require for the purpose. What are contour lines ? (7)

2. Plot the following survey to a scale of 200 ft. to 1 inch :—

S. 72½ E.	460 Ft.
S. 51½ W.	790 Ft.
N. 25 W.	700 Ft.
N. 54½ W.	340 Ft.
N. 32½ E.	530 Ft.
S. 72 E.	290 Ft.
S. 31½ E.	370 Ft.

(10).

3. Explain in full detail the method of loose needle surveying. State its advantages and disadvantages. (6).

4. A stack of coal measures 180' × 90' at the base, 150' × 6' at the top, and is 20' high. Calculate the weight of coal in tons. Assume that the coal in the solid weighs 0.9 ton per cu. yd., and in the heap weighs 60 per cent. of the weight of the coal in the solid. (7).

5. Draw on your paper an irregularly bounded area. Show how you would set off triangles, etc., in order to make a chain survey. State how you would range in poles for the purpose of chaining a line across a valley. (7).

6. Explain in full detail how you would proceed if you were asked to find the position of a surface point exactly above a certain point underground (8).

APPENDIX IV—*contd.*MISCELLANEOUS—*contd.*Statement No. 7—*contd.*

## INDIAN MINES ACT, 1901.

## EXAMINATION FOR COLLIERY MANAGERS' CERTIFICATES OF COMPETENCY.

*Second Class.*

## MACHINERY.

28th February 1923.

10 A.M. to 2 P.M.

NOTE.—The questions should not be copied. They may be answered in any order.

1. A road dips at the rate of 1 in 3; find the tractive force necessary to draw up a train of tubs weighing 10 tons. Find the useful horsepower developed if the speed is 8 miles per hour. Assume that the combined coefficient of friction of the tubs and rope is  $1/56$ . (14).

2. A windlass has a barrel 10" in diameter, and the circle described by the handles is 4 ft. in dia. What weight can be raised with two men at each handle, each exerting 26 lbs. pressure? (12).

3. What is meant by :—

(a) An electrical conductor.

(b) An insulator.

(c) A dynamo.

(d) An electric motor.

(e) A fuse.

(f) A double pole switch? (12).

4. Sketch and describe fully a simple non-condensing steam engine with reversing gear. What is a compound steam engine? (14).

5. Sketch and describe the arrangements you would make for slinging a steam pump in a sinking shaft, 200 ft. deep, which is to be sunk to a depth of 300 ft. Assume that the maximum quantity of water will not be more than 7,000 gallons per hour. (14).

6. Enumerate the essential fittings on a vertical boiler. Why is the manhole oval in shape? What is the effect of sediment or incrustation forming in a boiler, and how may danger arise therefrom? (14).

## Statement No. 8.

## DEPARTMENT OF INDUSTRIES AND LABOUR.

## NOTIFICATION.

*Simla, the 14th April 1924.*

No. M.-498.—In exercise of the power conferred by section 20 of the Indian Mines Act, 1901 (VIII of 1901), the Governor General in Council is pleased to direct that the following further amendments shall be made in the rules published with the notification of the Government of India in the Department of Revenue and Agriculture, No. 864—68-20, dated the 10th March 1904, the same having been previously published as required by sub-section (3) of the said section, namely :—

After rule 54 of the said rules, the following heading and rules shall be inserted, namely :—

*“ Rules for the examination and certification of underground sirdars.*

Rule 55.—With effect from the first day of January 1926, no person shall, save as hereinafter provided, be appointed to make the inspection required by sub-rule (a) of rule 4 unless he—

- (i) has within the preceding five years obtained a certificate from an authority and in a form to be prescribed by the Board of Examiners constituted under rule 28 to the effect that his powers of eyesight and hearing are such as to enable him to make the inspection efficiently and

APPENDIX IV—*contd.*MISCELLANEOUS—*contd.*Statement No. 8—*contd.*

- (ii) (a) holds a first or second class certificate of competency granted under these rules or a permit granted under rule 41, or is for the time being authorised under rule 49 to act as manager of the mine in which the inspection is to be made, or
- (b) holds a certificate, hereinafter referred to as an underground sirdar's certificate, to the effect that he is competent to perform the inspection required by rule 4 :

Provided that the holder of an underground sirdar's certificate shall not be appointed to make the inspection required by sub-rule (a) of rule 4 in a mine in which safety lamps are used or in which inflammable gas is likely to occur, unless his certificate bears an endorsement to the effect that he is competent to test for and detect the presence of inflammable gas.

*Rule 56.*—Where an emergency exists, the owner, agent or manager of a mine may appoint any person to make the inspection required by sub-rule (a) of rule 4 who, in his opinion, is competent to make such inspection, notwithstanding the fact that such person does not possess the qualifications prescribed in rule 55 :

Provided that such appointment shall not extend over a period exceeding one month :

Provided further that every such appointment and the reasons therefor shall forthwith be reported to the Chief Inspector of Mines. The Chief Inspector may cancel any such appointment and such cancellation shall be final.

*Rule 57.*—Underground sirdars' certificates shall be granted by the Board of Examiners constituted under rule 28 after such examination and in such form as the Board may, subject to the provisions of these rules, from time to time prescribe. The decision of the Board in regard to the grant or refusal of such certificate to any candidate for the same shall be final.

*Rule 58.*—Examinations for underground sirdars' certificates shall be held at such place and time as the Board of Examiners may from time to time prescribe, and shall be conducted by local examiners appointed by the Board. Such local examiners shall be subject to the orders of the Board in respect of all matters relating to the conduct of the examination and shall receive such remuneration as the Board may, with the sanction of the Governor General in Council, determine.

*Rule 59.*—(1) Examinations for underground sirdars' certificates shall be conducted orally in English or in the vernacular language of the district in which the examination is held and shall be designed to test the candidate's knowledge of the following subjects, namely :—

- (a) timbering,
- (b) methods of examination of the roof and sides of working places and travelling roads,
- (c) shot-firing,
- (d) mine gases and ventilation,
- (e) the provisions of the General and Spécial Rules for the time being in force under the Indian Mines Act, 1901, relating to the safety of persons employed in mines,
- (f) in the case of candidates for the endorsement referred to in the proviso to rule 55 the methods of testing for and detecting the presence of inflammable gas.

(2) The Board of Examiners may from time to time make regulations consistent with this rule in regard to the conduct of such examinations and every regulation so made shall be published in the local official Gazette.

*Rule 60.*—No person shall be permitted to appear as a candidate at an examination for an underground sirdar's certificate unless he has attained the age of 21 years and has satisfied the Board of Examiners that he has had not less than three years' practical experience in a coal-mine.

*Rule 61.*—(1) A fee of Rs. 5 shall be levied from every applicant for permission to appear as a candidate at an examination for an underground sirdar's certificate, and the amount of such fee shall in no case be refunded.

(2) A fee of Re. 1 shall be levied from every person, not being a candidate for an underground sirdar's certificate, whose eyesight and hearing are examined by the authority referred to in clause (i) of rule 55.

*Rule 62.*—If, in the opinion of an Inspector of Mines, a person to whom an underground sirdar's certificate has been granted under these rules is guilty of misconduct or incompetence in the discharge of his duties, the Inspector of Mines may suspend his certificate, and recommend its cancellation by the Board of Examiners. The Board shall, at its discretion, either remove the suspension or cancel the certificate, and the decision of the Board shall be final,

APPENDIX IV—*contd.*MISCELLANEOUS—*contd.*Statement No. 8—*concl'd.*

*Rule 63.*—(1) The Chief Inspector of Mines shall issue to every person to whom the Board of Examiners grants an underground sirdar's certificate, a metal check marked with the registered number of his certificate.

(2) The person to whom such metal check is issued shall, so long as the corresponding certificate remains in force, retain such check in his immediate possession, and shall not transfer it or dispose of it in any way. In the event of the corresponding certificate being cancelled, the check shall be returned to the Chief Inspector of Mines.

(3) No person other than the holder of the corresponding certificate for the time being in force, shall be in possession of a metal check issued under this rule.

*Rule 64.*—(1) The holder of an underground sirdar's certificate, granted under these rules, shall deliver such certificate to the owner, agent, or manager of any mine in which he is for the time being employed; and such owner, agent, or manager shall in exchange for the certificate deliver a receipt for the same to the holder and shall retain the certificate so long as the holder thereof is employed in such mine, and shall return it to the holder on his ceasing to be so employed.

(2) The owner, agent, or manager of any mine shall, on the demand of an Inspector of Mines, produce any underground sirdar's certificate held by a person employed in the mine.

*Rule 65.*—A register showing the names and addresses of all holders of underground sirdar's certificate shall be maintained in the office of the Chief Inspector of Mines, and a note of the cancellation of any such certificate shall be entered in such register.

*Rule 66.*—If any person proves to the satisfaction of the Board of Examiners that he has without any fault on his part lost or been deprived of a certificate granted to him under rule 57 otherwise than by the Board of Examiners under rule 62, the Board of Examiners may, upon such terms and conditions as they may determine, cause a copy of the certificate to which the applicant appears by the register to be entitled, to be delivered to him. The word "Duplicate" shall be stamped across every such copy, and a fee of Re. 1, which shall be payable in advance to the Chief Inspector of Mines at his office, shall be charged for it.

*Rule 67.*—If any person proves to the satisfaction of the Chief Inspector of Mines that he has without any fault on his part lost or been deprived of the metal check issued to him under sub-rule (1) of rule 63 otherwise than under the provisions of sub-rule (2) of rule 63, the Chief Inspector of Mines may, upon such terms and conditions as he may determine, cause a second metal check bearing the registered number of his certificate to be delivered to him. The letter "D" shall be stamped on the reverse of every such check, and a fee of annas 4, payable in advance to the Chief Inspector of Mines at his office, shall be charged for it."

A. H. LEY,

*Secretary to the Government of India.*

A copy is forwarded to all Local Governments and Administrations for information.

A copy is also forwarded to the

Chief Inspector of Mines in India
Railway Department
Joint Hony. Secy., Mining and Geological Institute of India,
Secretary, Indian Mining Association,
Secretary, Indian Mining Federation,

for information.

By order, etc.,

J. P. GANGULI,

*Assistant Secy. to the Govt. of India.*

**APPENDIX IV—concl'd.****MISCELLANEOUS—concl'd.**

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**Statement No. 9.****LAND ACQUISITION (MINES) ACT, 1885.**

Particulars required to be furnished by colliery owners to Local Governments when giving notice under Section IV of the Land Acquisition (Mines) Act, 1885, of their intention to work coal under land acquired for a railway :—

- (a) The name, residence and profession of the person giving the notice.
- (b) The name of the mine, together with that of the village and district in which the mine is situate.
- (c) The name of the railway line or of the siding and the main line to which the siding is attached, under which the mine is situate.
- (d) The names of the railway stations and the mileage between which the said siding or the said portion of the railway land, under which the mine is situate, falls.
- (e) The number and date of the declaration under which the land was acquired.
- (f) A tracing showing the boundaries of, and the area over which, the acquired land extends.

